33rd Year FEBRUARY, 1950

RUBBER AGE

AGERITE
STALITE

for

MINIMUM STAINING

GOOD AGE RESISTANCE

LOW HEAT GENERATION

MINIMUM DISCOLORATION BY LIGHT

R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.

CASH IN
on all the advantages of Neoprene Type W

IN YOUR PLANT

- Improved storage stability
- Greater flexibility in compounding
- Improved processability

IN YOUR PRODUCTS

- Extremely low compression set
- Brilliant colors
- *plus* all the superiorities inherent in products made of neoprene.

Yes, in your plant the plasticity, scorching tendency and cure rate of Neoprene Type W will be practically unaffected by long storage. And Type W will prove to be the easiest working neoprene you've ever tried. It has ideal processing properties . . . on the mill it readily forms a smooth sheet in which compounding ingredients will disperse quickly and uniformly. Type W possesses excellent resistance to mill breakdown, too. Even at high temperatures, it doesn't stick to mill and calender rolls.

You will be pleased with the combination of fast curing characteristics and safety that can be obtained with the use of organic accelerators—with or without sulfur.

In Type W vulcanizates, you can obtain compression set lower than the best obtainable with natural rubber. Through proper compounding this superiority can be maintained even at 212° F. Don't forget, too, that with Type W, brilliantly colored vulcanizates can be made which compare favorably with those of natural rubber.

So be sure you've investigated *all* the advantages this entirely new kind of neoprene offers. Samples are available on request.

E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Delaware.

● For complete information on Neoprene Type W, see Report 49-3. Ask for your copy if you haven't received one. See your Du Pont representative or send us your request.

DU PONT RUBBER CHEMICALS

E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York 19, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year; Canada, $3.50; Foreign, $4.00. February, 1950, Vol. 66, No. 5.

Get *extra* advantages in rubber compounding with Good-rite RESIN 50

REG. U. S. PAT. OFF.

This easy-processing stiffening agent
Saves masterbatching . . .
Improves molding and flow characteristics . . .
Gives better flex life, higher elongation . . .
Gives better abrasion resistance.

JUST look over those bonus advantages you get with Good-rite Resin 50. It's easy to see how this ideal reinforcing agent for natural and American rubber products helps you make important savings in time and money.

Good-rite Resin 50 is a high styrene-butadiene copolymer. It is made as a white, free-flowing powder. It can be compounded in a broad range of sales-attracting colors.

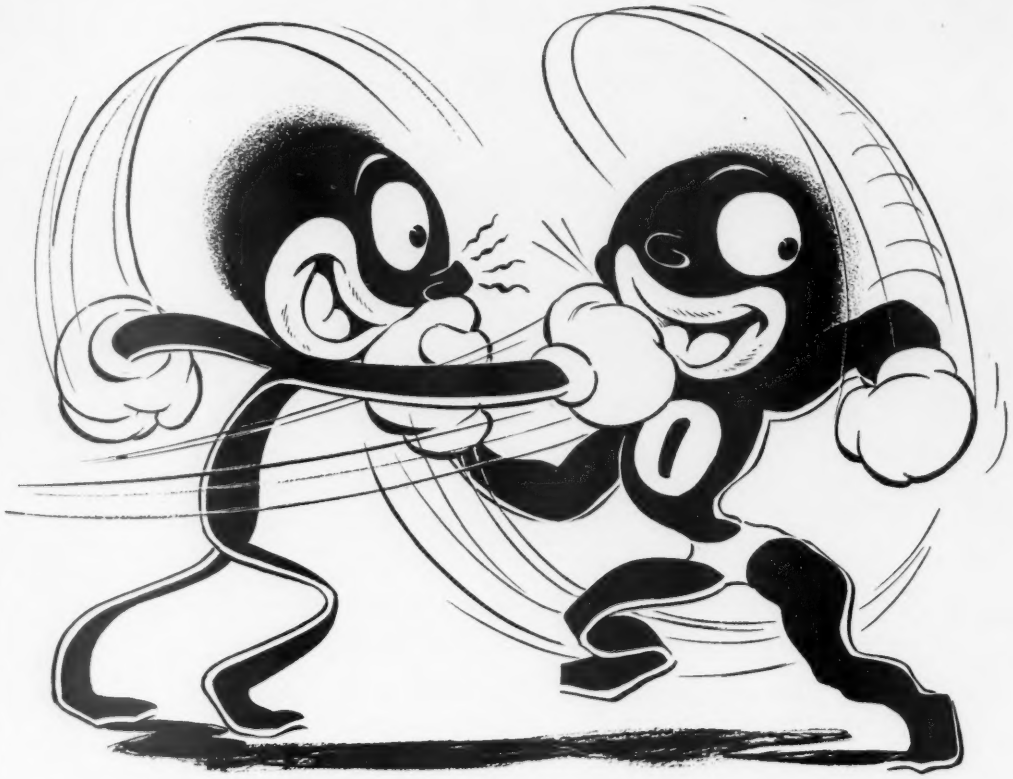
Resin 50 provides a positive reinforcement for rubber compounds, makes them more easily handled because it acts as a plasticizer at processing temperatures. Quality products in any hardness range can be obtained. Typical uses are in shoe soling compounds, floor tiling — many more are possible.

Write for complete information. Find out how you may use Good-rite Resin 50 to help cut your costs—and improve your products. Please address Dept. CA-1, B. F. Goodrich Chemical Company Company, Rose Building, Cleveland 15, Ohio.

Hycar Reg. U. S. Pat. Off. *American Rubber*

B. F. Goodrich Chemical Company A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers



To make tires tough, keep prices low—

Mix Philblack* A *with* Philblack* O!

They're well matched for championship performance! Philblack A has the edge in improving physical characteristics. He does an excellent job of dissipating heat. And . . . he saves you money! But Philblack O is the champion when it comes to long flex life and high resistance to abrasion.

Together, Philblack A and Philblack O make an unbeatable combination for producing low-cost, cool-running, longer-lasting tires! Order these versatile blacks in bags or in bulk. Always uniform in quality!

PHILLIPS CHEMICAL COMPANY

PHILBLACK SALES DIVISION

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Warehouses in Akron, Boston, Chicago and Trenton. West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.

*A Trademark

IT PUTS 233% MORE BOUNCES IN BASKETBALLS!

BASKETBALL cover stocks, too, enjoy added flex-life when reinforced by **Pliolite S-6.**

Tests showed that a typical rubber-covered basketball failed from flex-fatigue after 18,000 cycles that compressed it one-third. When **Pliolite S-6** was incorporated in the rubber stock, flex-fatigue life was increased up to 60,000 cycles — a jump of 233%.

Pliolite S-6 also improves abrasion resistance, keeping the ball looking better, longer. Laboratory tests prove weight loss through abrasion is 42% less when **Pliolite S-6** is added to the rubber stock.

Then, too, a well reinforced, light-gravity cover stock made with **Pliolite S-6** permits a better weight distribution throughout the ball.

Pliolite S-6 is a superior colorless reinforcing material. It is well adapted to all compounds needing a light-color, low-gravity stock of 70-100 durometer hardness with good processing characteristics and moldability. Its reinforcement is positive — coupling extra hardness with negligible loss in elongation. Often elongation is improved.

You'll find **Pliolite S-6** to be effective with GR-S, Neoprene, Buna N and natural rubber. It is available as a powder for your own mixing, or in master batches in whatever rubber you select. For complete information and sample, write: GOODYEAR, CHEMICAL DIVISION, AKRON 16, OHIO.

PLIOLITE S6

GOODYEAR

DOUBLE-CHECKED
CHEMICALS FOR THE
RUBBER INDUSTRY
For Latex Compounding
SHARPLES
ACCELERATOR 67
ZINC DIETHYLDITHIOCARBAMATE
Available in TWO Grades
SA 67-0
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SA 67-1
Coated with 2% mineral oil to reduce dusting in handling
Write to Dept. Q for samples
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CHEMICALS
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ALKYLOLAMINES - UREA DERIVATIVES
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Marvinol's extra toughness and dryness make plastics products more durable and pleasant to touch.

Superior dimensional stability makes Marvinol ideal in products that must not shrink.

In products that must resist chemical and abrasive action, Marvinol fortifies against oils, acids, wear, tear.

NEW THINGS IN PLASTICS

...faster, better with *Marvinol* vinyl resin

Marvinol's superior flexibility in low temperatures pays off in products subjected to severe exposure and cold weather.

If your product is one of these basic plastic shapes... one made from them, or even one that has possibilities for manufacturing from plastics, you'll find production time-savings and extra quality in using Marvinol vinyl resin. To improve your product test this remarkable vinyl polymer.

SEE WHAT *Marvinol* OFFERS YOU

Processors find Marvinol a big time-saver because of its shorter pre-mix, open mill and Banbury cycles.

Extruders of wire products, tubing, belting and other continuous cross-sectional shapes benefit from Marvinol's faster extrusion.

Marvinol may be extruded, calendered, injection molded, made into dispersions for casting film, spreading on fabric and slush molding.

Field engineers and customer research laboratories provide helpful technical service to Marvinol vinyl resin users.

IF YOU USE PLASTICS in any form, send for details about Marvinol. Naugatuck Chemical makes and sells Marvinol vinyl resins only as raw materials, but we will be glad to refer you to one of our customers for additional information on Marvinol. Write Dept. R-2, NAUGATUCK CHEMICAL, 501 E. Preston St., Baltimore 2, Md.

Marvinol

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DIVISION OF UNITED STATES RUBBER COMPANY

OTHER PRODUCTS OF NAUGATUCK CHEMICAL: Latex • Dispersions • Reclaimed Rubber Plastics • Synthetic Rubber • Rubber Chemicals • Agricultural Chemicals • Aromatics.

MR. CLIMCO SAYS...

CLIMCO LINERS

Permit Horizontal Storage of Stock

Horizontal storage is usually easier and more efficient — vertical storage has a tendency to curl the edges of the stock and liner, causing stock losses. When your liners are Climco Processed, you can confidently store them horizontally because the pressure of the roll will not cause sticking.

Climco Processed Liners will help you — whatever your method of storage.

They speed work by stopping stock adhesions and insuring easy separation. The life of your liner is increased, tackiness of the stock is preserved and loss of stock reduced. In addition to these production benefits, Climco Processed Liners protect the stock itself in many important ways.

Since 1922 Climco Processed Liners have proved their worth to the rubber industry. Give them a trial in your plant.

ILLUSTRATED LINER BOOKLET

Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

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THE CLEVELAND LINER & MFG. CO.
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4 NEW CHEMIGUM Latices

Now there's a Goodyear Latex for every processing need

Now every latex user can find the material he needs in the **Chemigum** line, for in addition to **Chemigum** 101A and 200—use-proved products—there are four NEW members of the **Chemigum** family of rubber and resinous latices:

CHEMIGUM 235A

CHEMIGUM 235B

These latices have a butadiene/acrylonitrile ratio of 55/45. Solids content is from 30 to 35%. Both have excellent oil resistance. **Chemigum** 235A is very well stabilized; 235B contains only the minimum amount of stabilizer necessary for protection during shipment.

CHEMIGUM 245A

CHEMIGUM 245B

Properties of these latices are similar to those of the other two new members of the **Chemigum** family, but the butadiene/acrylonitrile ratio of 245A and 245B is 67/33; solids content from 30 to 35%.

Ask for full details on these four new latices, as well as **Chemigum** 101A and 200. Write:

GOODYEAR, CHEMICAL DIVISION
AKRON 16, OHIO

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

USE PROVED *Products*

GOODYEAR

Chemigum—T.M. The Goodyear Tire & Rubber Company

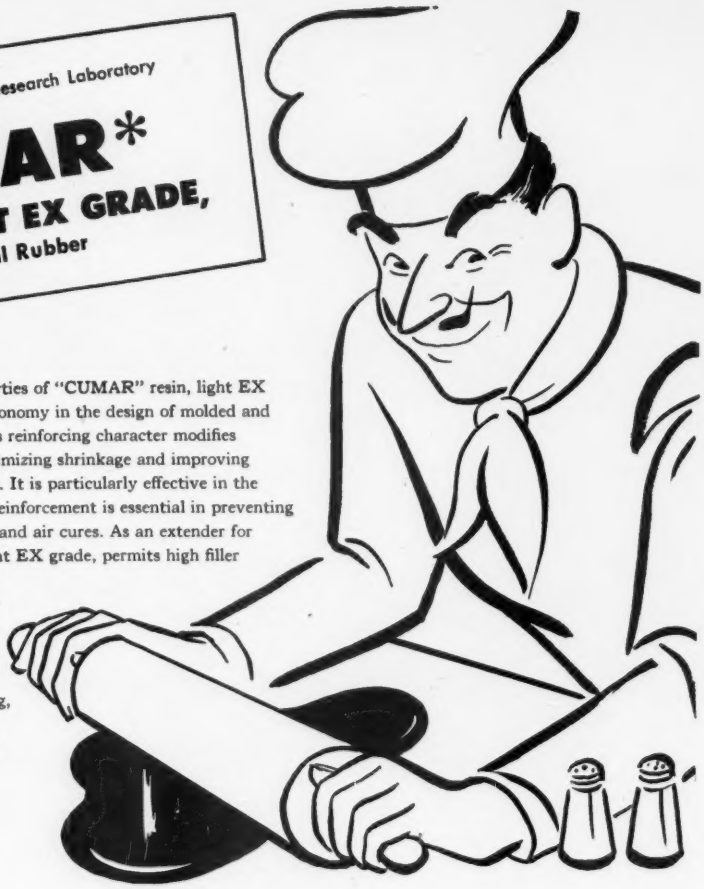
RECIPE

from the Barrett Rubber Research Laboratory
FOR

CUMAR*

RESIN, LIGHT EX GRADE,

in Natural Rubber



The reinforcing and extending properties of "CUMAR" resin, light EX grade, promote quality along with economy in the design of molded and extruded natural rubber products. Its reinforcing character modifies the nerve of the rubber, thereby minimizing shrinkage and improving processing and calendering properties. It is particularly effective in the production of extruded items where reinforcement is essential in preventing sagging and flattening in open steam and air cures. As an extender for natural rubber, "CUMAR" resin, light EX grade, permits high filler loading while maintaining quality. It is especially useful for improving tear resistance. Its application is in automotive and aeronautical parts, mechanical and proofed goods, footwear, soles and heels, flooring, matting, bumper and channel stocks, and in items which are to be used in contact with dark colored enamels and lacquers.

RECIPE

Smoked Sheets		100.00
CUMAR* Resin, Light EX Grade		15.00
"DIXIE" Clay		75.00
Calcium Carbonate (Precipitated)		75.00
"SILENE" EF		25.00
Zinc Oxide		5.00
Stearic Acid		2.00
"AGERITE" Alba		1.00
Paraffin		1.00
Red Oxide		5.00
Sulfur		3.75
Benzothiazyl Disulfide		1.25
DOTG		0.40
	Total	309.40
Specific Gravity		1.55
Rubber Hydrocarbon, % by weight		32.4
Rubber Hydrocarbon, % by volume		54.4
Mooney Viscosity, ML, 4 min. @ 212 F.		54

Scorch Test: Press Cures @ 250 F.

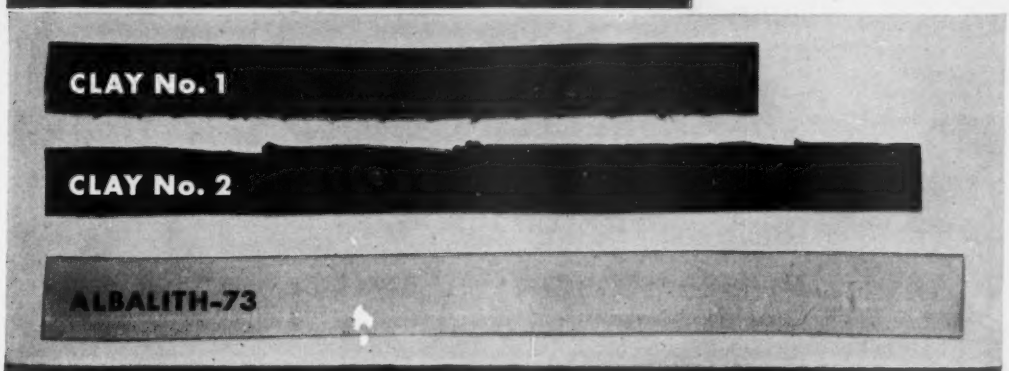
Minutes	Cure
5	None
10	None
15	Slight
20	Fair

Press Cure at 316 F. (70 lb.)—10 Minutes:	Unaged	Aged 24 hrs. @ 100 C.
Tension and Hardness Data		
Stress, 300%, Psi.	900	1000
Tensile, Psi.	1600	1250
Elongation, %	510	420
Hardness, Shore A	78	81
Tear Resistance, Angle, Pounds Per One Inch Thickness	135	145
Press Cure at 316 F. (70 lb.)—15 Minutes:		
Abrasion Resistance, Du Pont	375	340
Compression Set, 25% Constant Deflection, %	52.6	—
Resilience, Yerzley, 20% Deformation, %	45	36
Rebound, Goodyear-Healey, %	51.0	47.3
Contact Stain (24 Hours @ 175 ± 2 F.)	Slight	
Migration Stain (24 Hours @ 125 ± 2 F.)	Slight	

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Barrett*

*Reg. U. S. Pat. Off.



ALBALITH-73

CUTS PROCESS COSTS
SPEEDS PRODUCTION
STEPS UP QUALITY

ALBALITH-73 — the special lithopone coated with fatty acids—is more than a reinforcing pigment; it is also a definite aid to processing. Compared with low-cost extender pigments, Albalith-73 mixes faster on the rolls . . . produces more plastic stocks that make for smoother, quicker tubing . . . and imparts better physical properties.

These properties of Albalith-73 are obvious from the above photograph and from the following table based on a Butyl (GR-IR2) compound—a synthetic of current interest for high-voltage wire and cable.

Why not test Albalith-73 in your compounds now?

PROPERTIES of ALBALITH-73 in BUTYL (GR-IR2)

PIGMENT	BATCH MILLING TIME* (Mins.)	WILLIAMS Plasticity (70°C.@ 3 min.)	WILLIAMS Recovery (1 min.)	MOONEY Viscosity (ML100°C.@ 3 min.)	½ ROYLE** EXTRUSIONS (CC/min.)	CURED COMPOUND Tensile (PSI)	CURED COMPOUND Elongation (%)
Albalith-73	41	2.27	.31	66.5	105.8	990	730
Clay #1	47	2.60	.39	88.0	80.6	715	480
Clay #2	54	3.23	.30	93.0	98.0	1030	540

COMPOUND

GR-IR2	100
Sulfur	2
P-Quinone Dioxime	2
Benzothiazyl Disulfide	4
Stearic Acid	2
Protox-166 Zinc Oxide	5
Pigment	50 vol./100 vol. Rubber

Cure: 15 minutes @ 320°F.

(Source: Enjay Butyl Wire Insulation Reports #1 and #2)

* Stocks were milled on a 6" x 12" laboratory mill with a starting roll temperature of 30°C.

** Royle Tuber Conditions:

Head Temp.	140°C.
Extension Temp.	105°C.
Cylinder Temp.	105°C.
Stock Screw Speed	50 RPM

HORSE HEAD PRODUCTS

THE NEW JERSEY ZINC COMPANY

Founded 1848

160 FRONT STREET • NEW YORK 7, N. Y.

How Skellysolve helps 3 men Reach 1 Goal . . .

THE CHEMIST

finds that Skellysolve will enable the plant to make rubber cements with the properties he desires. So he informs

THE PURCHASING AGENT,

who orders a tank car of Skellysolve. The result is a superior compound which makes

THE SALES MANAGER'S

job easier. His tape customers are better satisfied, and the special qualities of his compound help him get new business from other users of rubber cements.

Selling More and Better RUBBER CEMENTS

"DOC" MacGEE SAYS:

You'll find this happening in several other branches of the rubber industry. Thus, if you use benzol, rubber solvent gasoline, toluol, ether, carbon tetrachloride or other solvents either in fabricating operations or in making rubber cements, find out what Skellysolve can do for you. Learn, too, about Skellysolve's famed dependability of supply . . . and the technical help you may receive from a Skellysolve Technical Fieldman.

the Rubber Industry and Skellysolve

There are six different Skellysolves for making rubber cements and for use in other rubber fabricating operations. Skellysolve has a minimum of greasy residues, thereby giving quick drying and high tensile strength. It is less toxic than many solvents, thus reducing health hazards. It has a minimum of unsaturates and impurities, thereby reducing the tendency to thin or gel. Its low vapor pressure eliminates bloated tubes or cans, and its sweet odor makes it pleasant to work with.

SKELLY

Skellysolve

SOLVENTS DIVISION, SKELLY OIL COMPANY, KANSAS CITY, MO.

Build top performance into your products with

NEOPRENE LATEX

In many products, neoprene latex has established new performance standards. Because only with neoprene latex can you get *all* these advantages:

- **Toughness and durability**
- **Sunlight resistance**
- **Excellent aging**
- **Flame resistance**
- **Oil resistance**
- **Low permeability to gases**

Individual types of latices are available to fit your specific product and plant requirements. In your plant you will find that the neoprene latices are:

- **Stable in storage**
- **Stable during compounding**
- **Stable during processing**
- **Adaptable to normal manufacturing methods**
- **Free from precure**

REPORT 48-1 contains more information on the currently available neoprene latices. Extra copies are available. Write: E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Delaware.

DU PONT RUBBER CHEMICALS

E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

DU PONT

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

for UNDER-FOOT

or FOOT-WEAR

. . . TITANOX ADDS QUALITY TO RUBBER

Whether underfoot in rubber tile; in rubber footwear or in numerous other articles, TITANOX pigments bring out the appearance of quality in white and light-tinted rubber goods—add good looks that bring increased sales. Chemically inert, these titanium pigments are highly compatible with all types of rubber. Their outstanding ease of mixing speeds production, helps save on production costs.

For pure gum and lightly loaded stocks the strongest pigments TITANOX-A and TITANOX-RA assure the desired whiteness or brightness at minimum loadings thus maintaining flexibility. For heavily loaded stocks, TITANOX-RCHT (rutile-calcium pigment) is preferred for economical whiteness and brightness. Its finely divided inert pigment and extender promote normal aging and add resistance to discoloration.

Our Technical Service Department is ready at any time to be a partner in solving your rubber pigmentation problems. Write us today for further information. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; 104 South Michigan Avenue, Chicago 3, Ill.; 2600 South Eastern Avenue, Los Angeles 22, Calif. Branches in all other principal cities.

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TYPICAL SAVINGS BY PER CENT

in Delivered Pound Volume Cost effected by replacing a widely used pigment with **Calcene T**

Based on 100% full replacement

Akron	Up to 44.7%
Baltimore	" " 40.4
Boston	" " 39.0
Buffalo	" " 38.3
Chicago	" " 36.2
Clarksville	" " 31.4
Detroit	" " 38.7
Hannibal	" " 30.6
Milwaukee	" " 34.0
Passaic	" " 39.4

Are you taking advantage of the economies provided by Calcene T over those of some other reinforcing pigments? You may find that Calcene T will enable you to reduce your production costs substantially and in many cases may bring about better compounding and product performance.

With production economies becoming a more and more important factor in your business, we suggest you investigate Calcene T now. Write for free Columbia Pigments Data Sheet No. 49-1. Pittsburgh Plate Glass Company, Columbia Chemical Division, Dept. R-1, Fifth at Bellefield, Pittsburgh 13, Pennsylvania.

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CALCENE T—specially prepared, white, coated, precipitated calcium carbonate of fine particle size.

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HI-SIL—a new hydrated silica pigment of extremely fine particle size—.025 micron.

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GENERAL LATEX

Announces

the purchase of an additional

LATEX RECEIVING INSTALLATION

at

Pier 6, Locust Point, Baltimore, Maryland

of the

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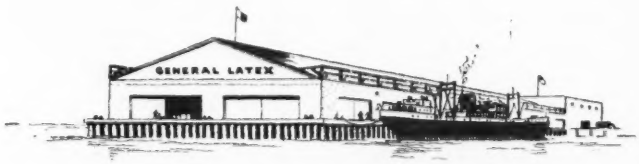
This pier is equipped with the most modern pumping and bulk storage facilities. It will provide a second port of entry for Harrisons & Crosfield Malayan latex and expedite service to General Latex customers in the Midwest, Central Atlantic, and Southern States.



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Importers and Compounders — Natural and Synthetic Rubber Latex

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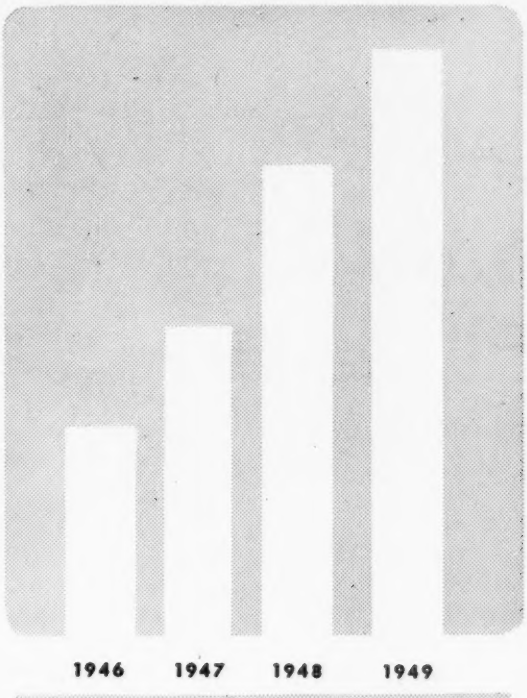
There's a reason why * more Crystex Insoluble Sulphur is being used every year!



* And the reason is that Crystex Insoluble Sulphur —99.5% pure, with 85% insoluble sulphur content—at its present lower cost helps to produce a better rubber product . . . economically.

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Please send
Crystex Insoluble Sulphur Circular

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ADDRESS _____

CITY _____

STATE _____

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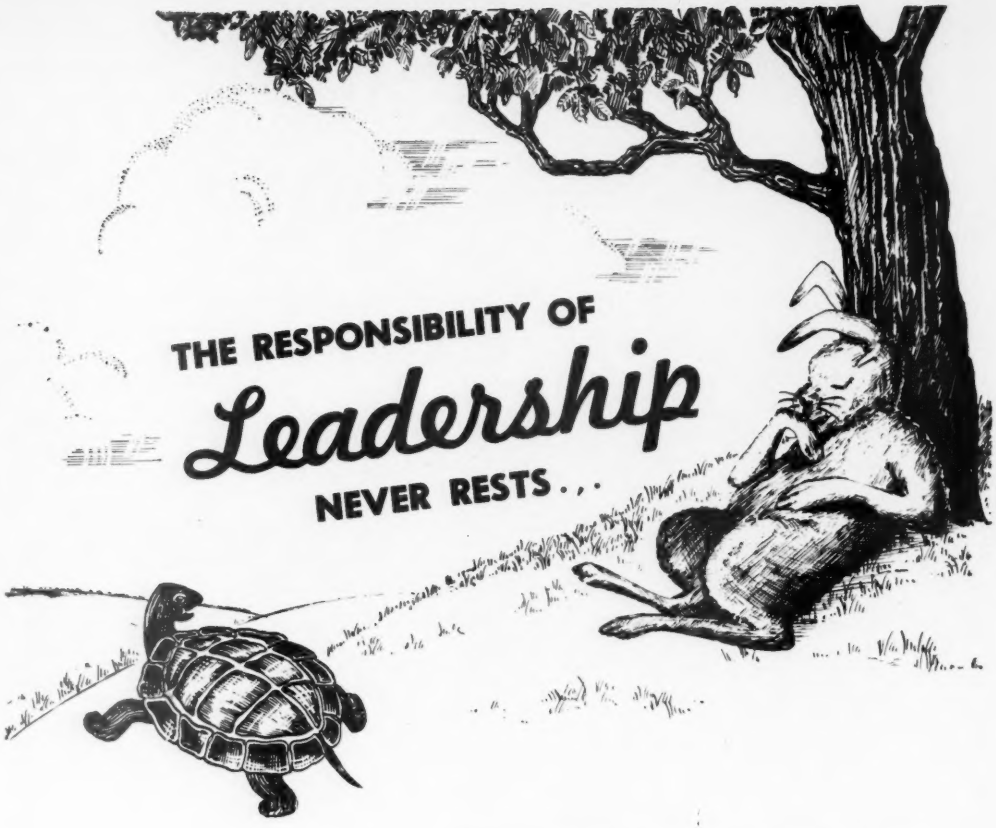

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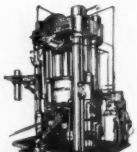
NINETY-TWO YEARS leadership in a highly specialized field is responsible for Robertson's reputation as a producer of fine high pressure hydraulic equipment. This responsibility constantly guides skilled technicians in making Robertson Equipment even better for tomorrow . . . in operating efficiency, quality of workmanship, and the best materials. It is even present in our desire to help you solve your hose lead encasing problems. Why not consult our capable engineers today.



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Designers and Builders of all Types of Lead Encasing Machinery
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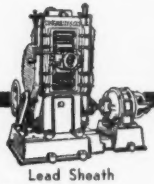
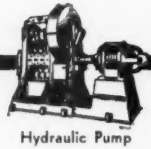


Lead Sheath
Stripping Machine



Hydraulic Pump

Open Lead
Melting Pot

Piccolyte

the Versatile Resin

gives you all this and LOW COST TOO!

- Light Lemon Color
- Color is Stable
- Hydrocarbon Structure
- No Acidity
- No Saponifiable Matter
- Chemical Resistance
- Solubility in Aliphatic Naphthas
- Thermoplastic

This highly-useful pure hydrocarbon, thermoplastic terpene resin has the same carbon-to-hydrogen ratio as plantation rubber. It has excellent tack-producing properties with natural rubber. Pale color permits light-color formulations with minimum scrap. Soluble in low-cost naphthas, and in pentane and hexane for making solvent-type rubber cements. It is non-toxic, chemically inert, compatible with most substances. Made in nine grades, uniformly dependable in quality.

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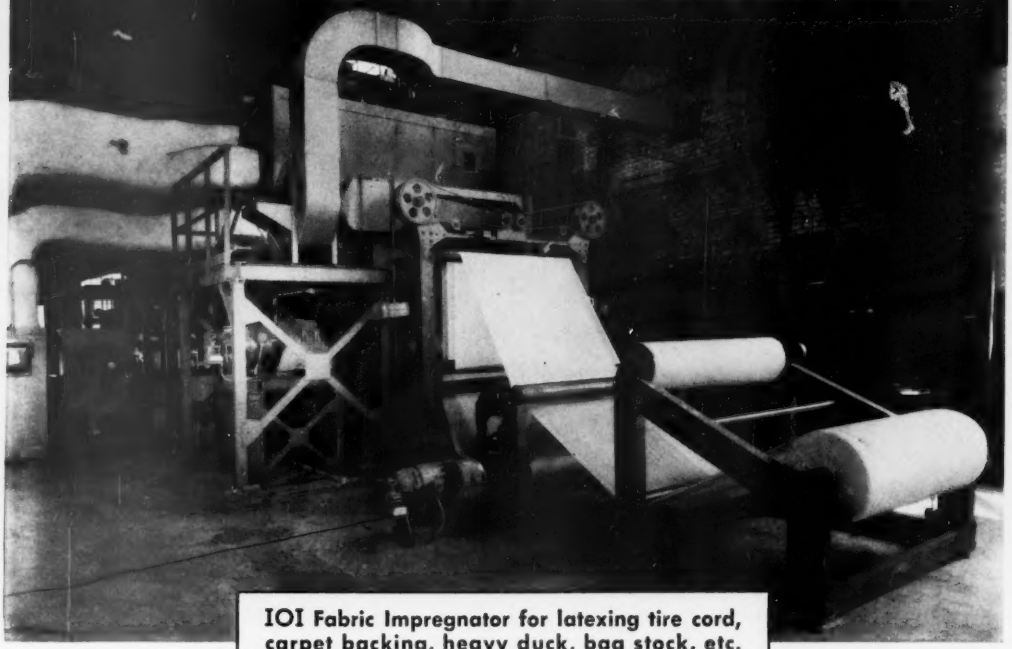

IOI Fabric Impregnator for latexing tire cord, carpet backing, heavy duck, bag stock, etc.

To men who know modern latexing operations this unretouched photograph tells its own story —of rugged construction, huskiness of drives, efficient arrangement of all component parts.

But it is *operating economy* that makes this machine's performance truly outstanding. It processes many yards of heavy fabric per minute. Operator-attendant requirements and down time for cleaning are the very minimum. And it provides complete processing control regardless of the speed at which it is operated.

IOI Impregnators and Coaters are available in a wide variety of standard sizes ranging from 5 yd. per minute export units to 70 yd. per minute calender train units. All are characterized by

- **Sound Engineering**
- **Economical Operation**
- **Rugged Construction**
- **Maximum Investment Return**

If you want to increase your production and cut your production costs in coating or impregnating operations, it will pay you to discuss your requirements with IOI.

TIRE FABRIC LATEXING MACHINES • SPONGE RUBBER DRYERS • V BELT, CORD COATING SYSTEMS

FABRIC COATERS AND SYSTEMS • CONSTANT TENSION WINDUPS AND UNWIND MACHINES • CURING OVENS

INDUSTRIAL OVENS, INC.

IOI ENGINEERING VERSATILITY

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points of interest

ABOUT "COLD RUBBER" AND CONTINEX SRF

- Approximately 35% higher loadings of Continex SRF, as used for the smooth tubing shown in the illustration, can be achieved more economically and with no sacrifice in processing safety and speed.
- Continex SRF in "Cold Rubber" enables the production of smooth tubing-channel compounds having minimum radial swell heretofore impossible with GR-S.
- Satisfactory compounds similar to the illustration can be produced containing from 0 to 50 parts reclaim per 100 parts "Cold Rubber."
- A non-staining Continex SRF can be supplied for specialty items where staining is objectionable.

Samples of Continex SRF and Continex SRF-NS (Non-staining), as well as formulations, will be supplied on request.

Also, for more complete information, write for Technical Service Report CB-3 "Smooth Tubing *Cold Rubber* Channel Compounds."

Continex SRF *can also be used in* natural *rubber smooth tubing-channel compounds with up to 35% higher loadings than are possible with a smooth-out type HMF black. Technical Service Report CB-2 gives details. Write for your copy* today!

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Use Du Pont **"Alamask"** odorants
TRADE-MARK

Nobody wants to buy a product with an unpleasant odor! But now—with Du Pont "Alamask" odorants—both your natural, neoprene and other synthetic rubber products can have a clean and pleasing odor. Unpleasant odors can be neutralized throughout.

Du Pont odor chemists, working with rubber technologists, have developed a series of "Alamask" odorants. These carefully tested odorants neutralize off-odors or give a pleasant scent, whichever you desire. You'll use them successfully on Latex, bonded fibers, adhesives, dipped goods, blown sponge and many other rubber products. There is no significant effect on processing characteristics or rate of cure.

Du Pont **"Alamask"** odorants
TRADE-MARK

Du Pont laboratory skill is at your service. Send for the booklet "Odorants for the Rubber Industry"—or ask us for specific recommendations for your individual problems. Write—E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Aromatics Section, Wilmington 98, Delaware. Branch Offices: Atlanta, Boston, Charlotte, Chicago, New York, Philadelphia, Providence, San Francisco.

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The quick action of Fawick Clutch and Brake Units gives rubber mill workers a vital safety control, with smooth, shock-free starts and stops. In addition, Fawick units deliver FULL drive power to the work being done.

Fawick Clutches provide automatic self-adjustment to compensate for wear, giving rubber mills high efficiency operation. They are rugged and precision-built of the finest materials, providing long maintenance-free life under heavy duty use.

For specific information on all advantages of Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland, Ohio, for Bulletin 300.

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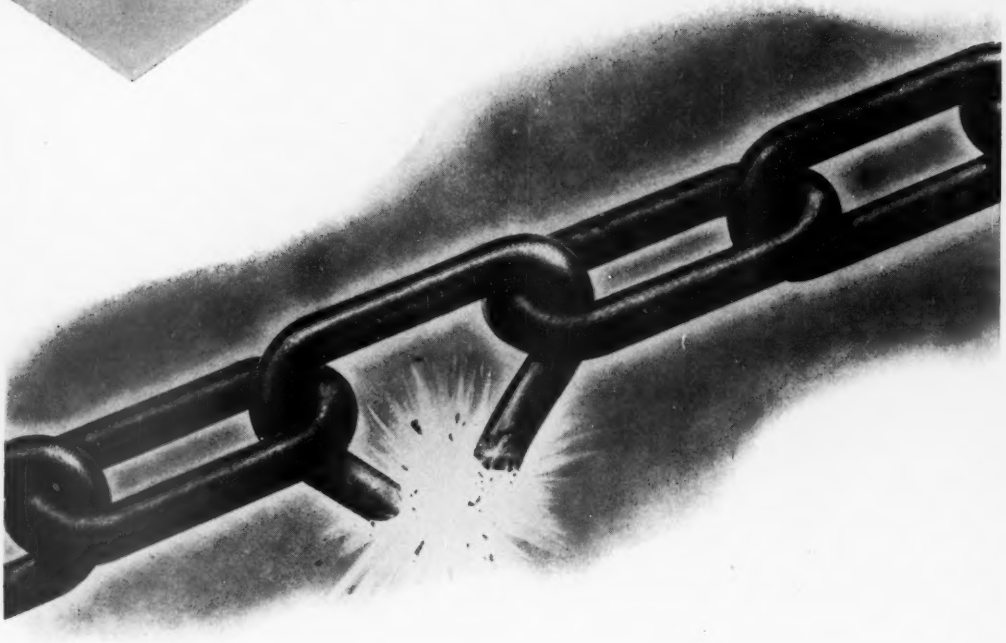

An old adage applies to Vinyl Plastics

The extender you use in your vinyl plastic can be the weak link in the finished product if it falls short in purity or uniformity.

You expect high standards of quality in resins, plasticizers and stabilizers because they are *chemically produced* under scientifically controlled conditions. You are assured of equally high standards in your vinyl extender when you specify one of DIAMOND'S line of Precipitated Calcium Carbonates, since they, too, are *chemically produced*, with resultant close control of purity and uniformity.

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"IT'S BETTER WITH

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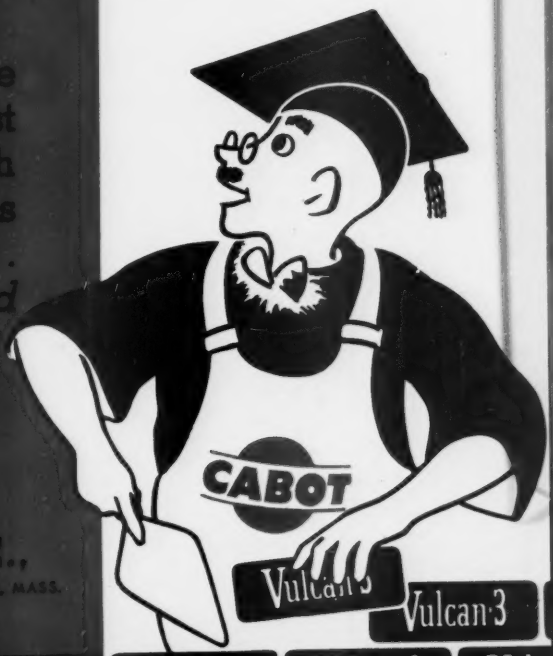
. . . . So we are expanding the production of Vulcan-3 as fast as we can, to keep pace with the growing demand for this superior H A F black . . . . *and it's growing by leaps and bounds . . . .*



GODFREY L. CABOT, INC.,
77 FRANKLIN STREET, BOSTON 10, MASS.

Vulcan-3 Vulcan-3 Vulcan-3

Air view of Wyandotte's South Plant, showing one of Wyandotte's Great Lakes fleet at dock-side.

We'd like you to know the whole family

You may find it profitable to get acquainted with Wyandotte's large but steadily growing family of organic and inorganic chemicals, for these three important reasons:

1. Wyandotte, with its own sources of raw materials — coal, limestone and salt — can furnish you with a steady, dependable supply of the chemicals you need — year in, year out.

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Such products as Wyandotte Precipitated Calcium Carbonate are ready to go to work for you. You'll find that this smooth, readily dispersible pigment makes an effective but economical extender and reinforcing agent in making high-grade rubber compounds.

We will be glad to send you complete data on this or any other Wyandotte chemicals for the Rubber Industry. Just write:

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SODA ASH • CAUSTIC SODA
BICARBONATE OF SODA
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OTHER ORGANIC AND INORGANIC CHEMICALS

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UNITED CARBON COMPANY, INC.

CHARLESTON 27, W. VA.

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UNITED BLACKS

Flames in a channel process plant.

DIXIEDENSED 77-EPC

DIXIEDENSED HM-MPC

United channel blacks have an enviable record for uniform quality and satisfactory performance. Years of experience and skill govern their manufacture.

United channel blacks are specification-made for use in your rubber, and they are repeatedly and thoroughly quality-checked by us in a number of ways.

United channel blacks are properly pelleted for ready breakdown and dispersion in your mixing and milling equipment.

United channel blacks are dependable for satisfactory processing at all stages and for quick, tight cures.

United channel blacks possess that high reinforcement so essential for the satisfactory performance of your goods in service.

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Here, at your service, is over a century of experience in producing fatty acids. It's the kind of background you want, to be sure of getting the right product at a fair price, 100% of the time!

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5 grades of *Stearic Acid* varying in composition and physical characteristics.

7 high-stability *Oleic Acids* with lowest unsaponifiable content . . . Emersol 233 LL Elaine is the purest oleic acid available commercially.

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Give your VINYL PLASTICS the VALUABLE PROTECTION of Dutch Boy* Stabilizers

Choose these for the best electrical insulation compounds

"DUTCH BOY" TRIBASE

Tri-basic Lead Sulphate. Tribase is the most basic lead sulphate available. It has a total lead content equivalent to 90% PbO, which means it affords maximum reactivity with the degradation products of vinyls caused by heat.

It is the quality stabilizer for vinyl insulation. The electrical characteristics and heat stability of vinyl compounds containing Tribase are unsurpassed!

"DUTCH BOY" TRIBASE-E

Basic Lead Silicate Sulphate. Tribase-E was specifically developed to answer the vinyl electrical insulation industry's demand for a stabilizer with exceptional heat stability and good electrical characteristics at low volume cost.

Tribase-E takes advantage of the electrical properties of lead silicates without sacrificing moisture repellency. The safe reactive lead content, together with the absence of any carbonate, eliminates danger of gassing.

TRADE NAME	CHEMICAL COMPOSITION	RECOMMENDED FOR USE IN
"Dutch Boy" Tribase	Tri-basic Lead Sulphate	Electrical compounds
"Dutch Boy" Tribase E	Basic Lead Silicate Sulphate Complex	Low volume cost insulation
"Dutch Boy" DS-207	Di-basic Lead Stearate	Sheeting, extrusion and molded compounds, i.e., insulated wire and vinyl phonograph records
"Dutch Boy" Plumb-O-Sil A	Co-precipitate of Lead Orthosilicate and Silica Gel	Translucent and colored sheeting and upholstery stocks
"Dutch Boy" Plumb-O-Sil B	Co-precipitate of Lead Orthosilicate and Silica Gel	Translucent film and sheeting, belting
"Dutch Boy" Plumb-O-Sil B Electrical Grade	Co-precipitate of Lead Orthosilicate and Silica Gel	Highgrade insulated wire and sheeting
"Dutch Boy" Dythal	Di-basic Lead Phthalate	General purpose stabilizer for heat and light
"Dutch Boy" Dyphos	Di-basic Lead Phosphite	Excellent for heat and light in all opaque stocks including Plastisols and Organosols
"Dutch Boy" Normasal	Normal Lead Salicylate	Vinyl flooring compounds. Rubber stocks as non-scorch activator

"DUTCH BOY" DS-207

Di-basic Lead Stearate. When used with Tribase or Tribase-E, DS-207 improves processing characteristics, water repellent properties and light stability of your vinyl insulation stocks. DS-207 has a double utility when used in Vinyl Plastics. It is an excellent heat and light stabilizer; it is an effective lubricant.

"Dutch Boy" Stabilizers—Tribase, Tribase-E, DS-207—impart excellent electrical properties, improved resistance to moisture, increased stability to heat and light aging.

They have maximum reactive lead content; they are widely compatible with other compound ingredients; they're economical.

And—like all "Dutch Boy" products—they're backed up by the solid reputation of the maker—National Lead Company.

Our technical staff will be glad to help you stabilize vinyl resins for any use. Write for complete information.

Dutch Boy

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CHEMICALS

NATIONAL LEAD COMPANY

111 Broadway New York 6, N.Y.

milestones of progress in rubber making

Here are some dates to remember in the development of the rubber industry:

1931 *Thiokol*

1931 *Neoprene*

1940 *Nitrile Rubber*

1943 *GR-S*

1948 *GR-S Cold*

1949 *No. 1 Ribbed Smoked Sheets—Plus**

* A MAJOR DEVELOPMENT in the processing of rubber is now possible with Calco's new plasticizer, PEPTON® 22. Added to the latex prior to coagulation, it forms No. 1 Ribbed Smoked Sheets—Plus.

PEPTON 22 Plasticizer can also be added to GR-S or natural rubber in the open mill or in the banbury.

In all cases it cuts breakdown time at least 50%, reduces power consumption, improves processing qualities—without affecting the physical or aging characteristics of rubber.

Calco

AMERICAN Cyanamid COMPANY
CALCO CHEMICAL DIVISION
RUBBER CHEMICALS DEPARTMENT
BOUND BROOK, NEW JERSEY

SALES REPRESENTATIVES AND WAREHOUSE STOCKS: Akron Chemical Company, Akron, Ohio • Ernest Jacoby and Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill. • H. M. Royal, Inc., Los Angeles, Calif. • H. M. Royal, Inc., Trenton, N. J. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

for abrasion resistance use Marbon 8000 in your rubber compounds

Obtain better wear and tear resistance for your compounds by the use of

Easy Processing MARBON "8000"

(A New High-Styrene Reinforcing Resin)

MARBON "8000" is economical to use

Investigate volume-cost replacement of various fillers and reinforcing agents.

Observe decreased power consumption with MARBON "8000" in heavily loaded stocks.

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DOW CORNING SILICONE RELEASE AGENTS

to improve your quality and reduce your costs...

There's a Dow Corning Silicone to solve almost every release problem

HEAVY SERVICE AND PASSENGER TIRES
One tire manufacturer reports saving $1500.00 a week in reduced mold maintenance costs alone.

CURING BAGS

GREEN TIRE CASINGS
DC Mold Release Fluid reduces rejects to an all time low.

DC Mold Release Emulsion No. 35A
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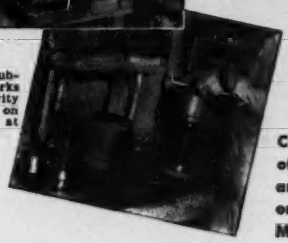
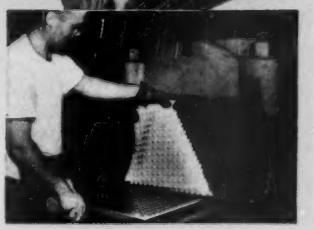
HEAVILY LOADED STOCK
"never before have we obtained such perfect appearance in molding heel and sole stock."

FAST CYCLE MOLDING
"the only mold lubricant that works on these 250 cavity deep draw molds on a 6 min. cycle at 350°F."



DEEP CAVITY MOLDS

"all production molds for floor tile now lubricated with DC MRE 35."



WHITE STOCK
"DC MRE 35A gives easy release plus flawlessly white finish in molding heavily loaded white stock."

Call our nearest branch office for technical assistance on release problems or write for data sheet No. M-14.

Have You tried **DC 1107 SILICONE**

TREATED "*ab*hesive" PAPER

for use as interleaving sheets for uncured rubber? Available now from various paper mills or write Dept. 7.

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at Little Cost!

BEACOFINISH—a unique family of coating materials conceived to give your products greater durability and eye appeal. These highly concentrated wax emulsions that can be diluted with up to four parts of water can be used with the utmost safety and economy.

BEACOFINISH is therefore of four-fold importance to you:—

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3. ***It's Economical*** because its high dilution potential (without losing efficiency) allows one gallon to cover 15,000 sq. ft.
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BEACOFINISH can be applied by dipping, sponging, spraying or brushing—dries in about 20 minutes—faster if force-dried—to give a hard protective coating of great elasticity.

BEACOFINISH may be ordered in Neutral or Black, in varying degrees of luster from brilliant to dull. It is so concentrated, from one drum you can obtain potentially up to five drums of superior coating for your products.

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Let us show you how BEACOFINISH can make your products more attractive and saleable—protect them from damage—you from loss—in production and transit!

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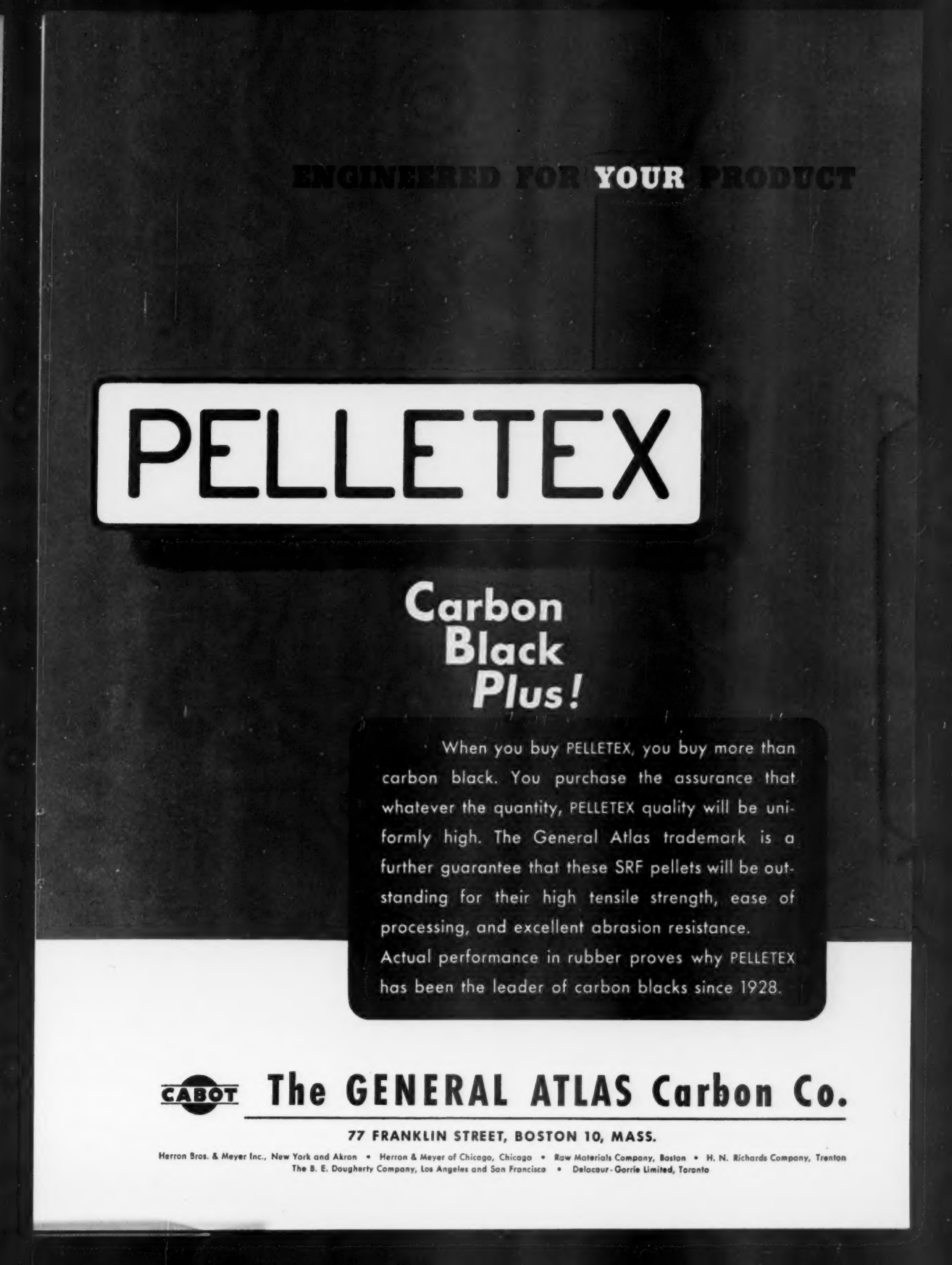
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Carbon Black Plus!
When you buy PELLETEX, you buy more than carbon black. You purchase the assurance that whatever the quantity, PELLETEX quality will be uniformly high. The General Atlas trademark is a further guarantee that these SRF pellets will be outstanding for their high tensile strength, ease of processing, and excellent abrasion resistance.
Actual performance in rubber proves why PELLETEX has been the leader of carbon blacks since 1928.
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"RUBBER STATISTICAL BULLETIN"

Issued monthly, the RUBBER STATISTICAL BULLETIN is published by the Secretariat of the Rubber Study Group. This group, with headquarters in London, is the international organization which was established to collect statistical and other general information on rubber. Regular statistics are furnished by the numerous governments cooperating in the program, with the result that the figures appearing in the BULLETIN are the nearest approach to world-wide official figures.

Each issue of the BULLETIN is replete with up-to-the-minute world-wide data on the production, exports, imports, consumption and stocks of rubber. Over 55 separate tables are used to enable the user to locate specific information on any phase of the rubber picture. Each issue is divided into 8 separate sections, as follows: Natural Rubber, Natural Latex, Synthetic Rubber, Synthetic Latices, Natural and Synthetic Rubber, Reclaimed Rubber, Rubber Manufactures, and General.

The data furnished in the BULLETIN is of utmost importance to all rubber manufacturers as well as to Brokers, Dealers, Importers and Commodity houses of all kinds. Specimen copies will be furnished without charge on request.

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Ask your Calco representative for information and grade of UNITANE best suited to your needs.

Calco

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CALCO CHEMICAL DIVISION
PIGMENT DEPARTMENT
BOUND BROOK, NEW JERSEY
Branch Offices and Warehouses in Principal Cities

Cancer's danger signals

1. Any sore that does not heal
2. A lump or thickening in the breast or elsewhere
3. Unusual bleeding or discharge
4. Any change in a wart or mole
5. Persistent indigestion or difficulty in swallowing
6. Persistent hoarseness or cough
7. Any change in normal bowel habits

can be your safety signals

Cancer is curable if discovered early and treated properly

If any of these symptoms appear, see your doctor *at once.*

Write for the booklet about cancer. Just address your request to "CANCER".

AMERICAN CANCER SOCIETY, INC.

To Help Close "The Dollar Gap"

NATURAL RUBBER GROWERS SET UP BUREAU TO EXPAND U. S. MARKET

Every leading American statesman and economist — including in recent weeks President Truman, Secretary of State Acheson, and "Marshall Plan" Administrator Hoffman — have been urging overseas countries to sell more goods to the U. S.

They point out that Marshall Aid cannot go on forever, that the present un-balance of trade between the U. S. and other countries leads to economic chaos, and that it is undesirable to achieve a balance of trade by cutting down on U. S. exports.

Only One Answer

So they *all* come to the *same* conclusion — that the only answer is for the U. S. to IMPORT MORE GOODS!

And — they ALL AGREE that the real answer is for industries in other countries to do a better *SELLING JOB* in the U. S. — to study U. S. markets, to advertise, to merchandise their products.

And it is for just such purposes that the leading dollar-earner of all the industries in the sterling area — the rubber producer — has set up the Natural Rubber Bureau in the U. S.

REAL RUBBER FACTS

Natural rubber is the No. 1 dollar-earner for sterling countries.

* * *

In 1949, the United States imported about 600,000 tons of natural rubber from Southeast Asia.

* * *

Natural rubber is now selling below pre-war prices. Its production and price are unrestricted and unsubsidized.

Natural rubber is the key to the prosperity of Southeast Asia — including over 400,000 independent rubber farmers in Malaya alone.

* * *

In addition to being the chief ingredient for tires, natural rubber has a growing market in latex foam cushioning and a great potential market in rubber roads.

To Promote New Uses

The British Rubber Development Board, representing these rubber growers of Southeast Asia, has established the Natural Rubber Bureau in Washington, D. C. to promote new uses for natural rubber in the U. S. A.

Natural rubber alone earned nearly as many dollars for the sterling area last year as did all of Britain's manufactured goods.

And this was in spite of the fact that natural rubber was selling to American rubber manufacturers this past year at *less than pre-war* prices — while every other major agricultural product in the world was selling at *two or three times* pre-war costs.

And the natural rubber producers are going about expanding their market in the American way — by market research, by advertising, by promoting their product.

They are trying to sell more in the U. S., to earn more dollars to close the gap, to make Marshall Aid less needed, to make it possible for other countries to buy more U. S. goods, and to achieve a stability and prosperity among free nations.

Full page advertisements will appear in leading national consumer magazines to promote such new uses for natural rubber as rubber roads, latex foam cushioning, etc.

Natural Rubber Bureau

1631 K St., N. W., Washington 6, D. C.

Natural Rubber

Nature and Science Serving Mankind

This booklet, "Stretching Highway Dollars With Rubber Roads," is being offered in current consumer advertising. Write for your free copy today to Dept. C10, NATURAL RUBBER BUREAU, 1631 K St., N.W., Washington 6, D. C.

Need more protection?

STABILITE*

THE ANTIOXIDANT WITH UNIQUE CHARACTERISTICS

When looking for the most economical and outstanding antioxidant for both natural and synthetic rubber, consider STABILITE, which has, combined in one material, the following characteristics:

1. *Protection against oxidation and heat, suncheck-ing and mechanical flexing.*
2. *Distinct softening effect on uncured rubber or GR-S, resulting in better processing and dispersion, smoother calendering and tubing and at the same time without effect on modulus at cure.*
3. *The unique property of increasing the effect of most commercial antioxidants when used in conjunction with* STABILITE. *The effect of such mixtures is greater than the components.*

For the protection of your rubber products use STABILITE; for maximum resistance to oxidation, heat, sunchecking and mechanical flexing replace part of your present antioxidant with STABILITE.

*MANUFACTURED BY CHEMICO, INC.
THE C. P. HALL CO. *Manufacturing Agents*

The C. P. Hall Co.
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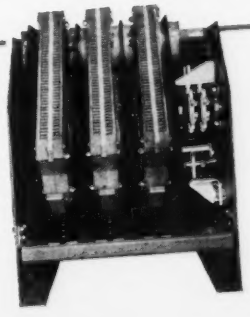

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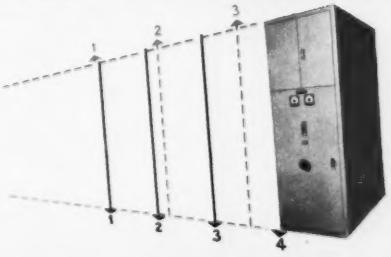

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10 THE WALL STREET JOURNAL.

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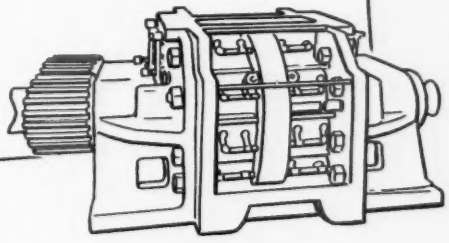

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CONTENTS FOR FEBRUARY, 1950

Field Experiments with Powdered Rubber in Bituminous Road Construction—*By T. E. Shelburne and R. L. Sheppe* 531

Development of Machinery for Curing Tires—*By L. E. Soderquist* 539

Farrel-Birmingham Testing Laboratory: A Photo Story... 542

Properties and Utilization of Polyacrylic Rubbers—*By H. P. Owen*..... 544

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REGULAR DEPARTMENTS

Book Reviews	582	Los Angeles News	568
Canadian News	568	Names in the News	560
Chemical Prices	588	New Equipment	572
Classified Ads	598	New Goods	—
Coming Events	552	Obituaries	570
Editorials	549	Rubber, Cotton Markets..	586
Financial News	563	Statistics	*

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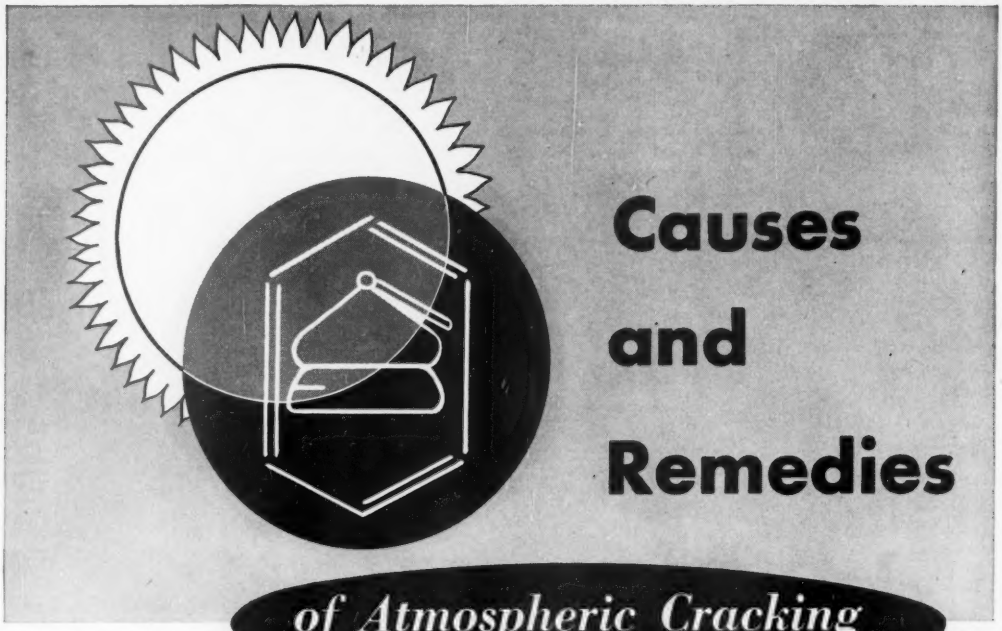

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Vol. 66, No. 5 FEBRUARY, 1950

Field Experiments with Powdered Rubber in Bituminous Road Construction

By T. E. SHELBURNE and R. L. SHEPPE

Council of Highway Investigation and Research, Commonwealth of Virginia, Charlottesville, Va.

INFORMATION concerning foreign experiments with rubber in bituminous road surfaces indicates that such combinations may have merit. It is claimed that the addition of small percentages of rubber results in a more durable mixture—one that is less susceptible to temperature change, thereby having less tendency to bleed or shove at high temperatures or to crack at low temperatures. Resistance to skidding is also said to be improved.

This report describes the early results of three field experiments with powdered rubber built in the summer of 1949 by the Virginia Department of Highways on U. S. Route 250, west of Richmond. In Section 1 powdered natural rubber was incorporated in the bituminous concrete sand asphalt wearing surface. Section 2 was a similar surface to which reclaimed powdered rubber was added. The third section was a seal treatment with cut-back asphalt (RC-2) to which natural powdered rubber was added and mixed in the distributor prior to application. Identical sections (1-C, 2-C and 3-C) without rubber were constructed adjacent to the experimental ones for purposes of comparison. Sections 1 and 1-C were constructed in May, 1949, and the remaining ones in September, 1949.

Complete records were secured at the time of construction concerning materials, quantities, procedures, temperatures, workability, etc. Follow-up studies since construction included visual observations, road roughness measurements, and skid tests. Since Sections 1 and 1-C were constructed earlier, more data is available on their performance, particularly as related to skid resistance.

At this time little, if any, difference can be noted between comparable sections with and without rubber. Road roughness measurements made on Sections 1 and 1-C shortly after construction indicated no significant differences between the two sections that could be attributed to the use of rubber. In both sections, however, the outside lanes which carry the majority of traffic were considerably rougher than the inside or passing lane.

Two series of skid tests have been conducted on Sections 1 and 1-C—one immediately after construction (May, 1949), and the other six months later (November, 1949). Only one test series has been performed on the remaining sections. These were made in November, 1949.

Resistance of the surface to skidding was determined by the stopping distance method. All surfaces including the control sections were found to have satisfactory resistance to skidding both in a dry and in a wet condition. Stopping distances on Section 2, containing reclaimed rubber, were practically identical with those on the control section (2-C). The seal treatment (Section 3), including natural powdered

Note: This paper was presented at the 29th Annual Meeting of the Highway Research Board, December, 1949.

rubber, indicated a slight beneficial effect since the stopping distance on the wet surfaces at 40 m. p. h. was about three feet shorter than on Section 3-C. It is possible that slight surface texture variations may at least partially account for the difference. Additional tests will have to be made for further evaluations.

Skid results on the older sections (1 and 1-C) in a wet condition appear to be more significant. Results are summarized below:

STOPPING DISTANCE (FEET)

Speed (M.P.H.)	10	20	30	40
Immediately After Construction				
Section 1-C, Plain	4.9	21.3	49.9	93.7
Section 1, with natural rubber	5.1	21.1	49.1	87.9
Difference	—0.2	0.2	0.8	5.8
Six Months After Construction				
Section 1-C, Plain	6.0	25.5	57.0	101.2
Section 1, with natural rubber	5.1	22.6	49.2	87.5
Difference	—0.9	2.9	7.8	13.7

From the data it appears that the incorporation of natural rubber in the bituminous concrete (F-1 sand asphalts) resulted in a slight difference in stopping distance at the time of construction, particularly at higher speeds. After six months, greater differences in stopping distances on wet pavements were found between the section containing natural rubber and the one without it. On the rubber section (1) stopping distances for the two test series were practically identical; however, on the plain section (1-C) they had increased considerably during the six month period.

While conclusions cannot be drawn at this early date regarding improvement in durability characteristics small percentages of natural rubber may be beneficial in minimizing the change in resistance to skidding of bituminous plant mix sand asphalt surfaces when wet. In order for such mixtures to be generally accepted they must not only show improved performance but also prove economical to the user.

Review of Previous Work

Experiments with rubber-asphalt mixtures have been conducted for several years in foreign countries, principally by the Dutch in Holland and the East Indies. The first published report of results of a systematic investigation into the changes produced by the addition of rubber to asphalt was published by Van Heurn and Begheyn *(1)* in 1934. In 1931 Fol and Bijl *(2)* reported some experiments conducted for the Technical Department of the International Rubber Association. This work was continued in 1933 by Plazier *(3)* who used unvulcanized powdered rubber instead of latex rubber solutions or vulcanized rubber (such as ground automobile tires) which were used in most of the earlier investigations. Mixtures with varying percentages of rubber were made by stirring the required amount of rubber powder into the melted bitumen and heating for one hour to about 150° C. It was found that the addition of a small amount of rubber made the asphalt less susceptible to temperature changes and therefore less likely to bleed in summer or crack in winter.

Several methods of constructing rubber asphalt pavements were employed in these experimental projects. A premixed material was used in a light surface course at the rate of 10 to 13 lbs. per sq. yd. Seal treatments consisted of applying the rubber-asphalt mixture on the surface, covering with aggregate and rolling lightly. Other surfaces constructed were asphaltic concrete carpets containing rubber powder throughout their entire thickness.

Dr. F. T. Bokma *(4)* reviews the status of experimental work in his paper "Rubber in the Construction of Roads". He states that between the years 1935-1940, some 30 test areas were constructed by the Rubber Foundation in collaboration with government institutions. Of these areas, many in both Holland and the East Indies were destroyed as a result of inundation or fighting during the recent war. However, of the remaining areas, the rubber-asphalt sections performed much better than the control sections with a life of 8 to 10 years where only a thin surface dressing was used over coarse asphaltic concrete. Where rubber was used throughout the entire thickness of asphaltic concrete mixtures there was very little difference between these sections and the controls so that a period longer than 10 years is necessary to determine the advantages of adding rubber-powder. Dr. Bokma also found that the use of small percentages of rubber in asphaltic mixtures increased the skid resistance of the surface and reduced maintenance costs.

Rubber has been used in the United States in rubber-asphalt compounds for sealing joints in concrete pavements for several years. However, to the writers' knowledge, it was not used in surface courses until the summer of 1948 when the city of Akron, Ohio *(5)*, constructed a street using a mixture of powdered synthetic rubber with the asphalt. In this work the asphalt was heated to approximately 300° F. and the rubber powder slowly sifted in with agitation and mixed for two hours. Rubber was added in the amount of 5 per cent and 7.5 per cent by weight of the asphalt. A bituminous concrete surface was constructed using a 1½ in. binder course over which was placed a 1½ in. surface course containing rubber. This plant-mixed surface course is much thicker than was used in most of the Dutch experiments.

Theories have been advanced regarding what actually happens when powdered rubber is incorporated with asphalt. It is reported that a study of photomicrographs indicates that homogeneous solutions do not result, since particles of rubber can be distinctly seen in the mixture. Some investigators speculate that the lighter oily constituents of the asphalt are slowly absorbed by the rubber causing it to swell and that this process can be hastened by heating. The writers have no data on this subject; however, prior to the initiation of the field experiments some exploratory tests were conducted in the laboratory by the Division of Tests *(6)* to determine if various percentages of natural rubber powder affected standard test results of asphalts.

Accordingly various percentages of rubber were mixed with 85-100 and 200-300 penetration grade asphalts (AP-3 and AP-00, Va. Spec.) and tested for penetration, softening point, ductility, specific gravity and flow. These tests indicated that blending temperatures were critical and that best results were obtained at a temperature range of from 170 to 190°C. (340 to 375°F.). At lower temperatures uniform results were not secured and at higher temperatures decomposition of the rubber was noted. For mixes blended (from 0 to 15 per cent rubber) within this temperature range the penetration, ductility and flow decreased and the softening point increased with increasing amounts of rubber. The addition of rubber powder to the two grades produced parallel results which would indicate that comparable effects could be expected with intermediate grade asphalts.

Construction of Field Sections

Originally it was proposed to construct experimental sections containing natural, synthetic and reclaimed rubber; however, since synthetic rubber was not available,

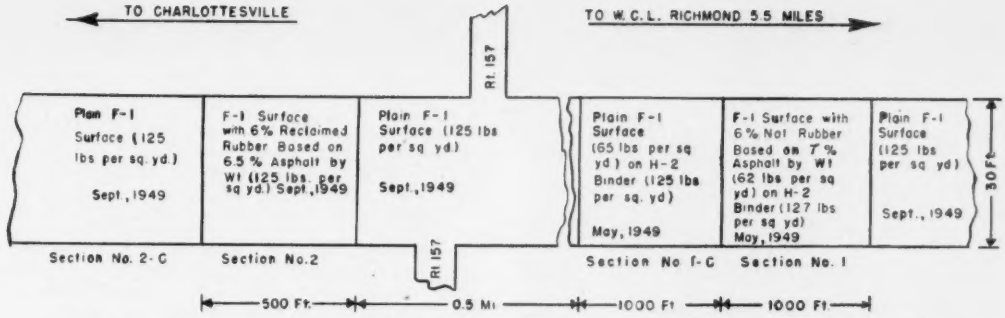
TO CHARLOTTESVILLE
TO W.C.L. RICHMOND 5.5 MILES
Rt. 157
Plain F-1 Surface (125 lbs per sq. yd.) Sept., 1949
F-1 Surface with 6% Reclaimed Rubber Based on 6.5 % Asphalt by Wt (125 lbs. per sq yd.) Sept., 1949
Plain F-1 Surface (125 lbs per sq yd) Sept., 1949
Plain F-1 Surface (65 lbs per sq yd) on H-2 Binder (125 lbs per sq. yd) May, 1949
F-1 Surface with 6% Not Rubber Based on 7 % Asphalt by Wt (62 lbs per sq yd) on H-2 Binder (127 lbs per sq yd) May, 1949
Plain F-1 Surface (125 lbs per sq yd) Sept., 1949
30 Ft.
Section No. 2-C
Section No. 2
Rt 157
Section No 1-C
Section No. 1
500 Ft.
0.5 Mi
1000 Ft
1000 Ft

FIG. 1—Field experiments with rubber in bituminous plant mix, Route 250, Henrico County, Va.

only natural and reclaimed rubber were used. Most foreign experiments were reported to have been constructed by hand methods. It was believed that if these experiments were to be of maximum value they should be built by machine methods. It was therefore decided to construct a section 1000 feet in length using a binder course and a bituminous concrete (F-1 sand asphalt) wearing surface in which a small percentage of powdered natural rubber had been incorporated at the plant. Otherwise this bituminous concrete was to be designed and constructed in accordance with our standard procedures. Adjacent to this section was constructed a control section identical in every respect except that no rubber was added. These sections are identified in Figure 1 as 1 (experimental) and 1-C (control). Section 2, in which reclaimed rubber was incorporated, and 2-C, without rubber, were constructed later in the season as part of a large project (Figure 1).

Realizing that several years might be necessary before any decided differences in performance might be apparent between the sections containing rubber and the control sections, it was decided to try the natural rubber in a seal treatment. The life of such surfaces is much less than that of the bituminous concrete and such treatments are usually rather critical as to weather conditions and control quantities. Often seal treatments bleed excessively. The location of this (Section 3) and the control (Section 3-C) is shown in Figure 2. Design and construction details follow for each of the three experiments.

Sections 1 and 1-C: Sections 1 and 1-C constructed of Type F-1 sand asphalt are located on U. S. Route 250 about 5.5 miles west of Richmond, Virginia. The road is 30 feet in width with a macadam base and an old plant-mix surface. The average 24-hour traffic volume for the year ending June 30, 1949, was 3135 vehicles, 768 of which were trucks and buses.

The aggregate (⅜ in. maximum size) selected for this section was a 50-50 mixture of natural sand and granite screenings. The per cent of asphalt (85-100 Pen. grade) required was determined by the surface area method and checked by density and stability tests. It was found that 7 per cent asphalt gave a satisfactory mix. Based on the grading of the aggregates and the above tests, Dr. F. T. Bokma, who furnished technical advice on the use of rubber, recommended a rubber content of 6 per cent by weight of asphalt or 0.42 per cent by weight of the total mix. This rubber powder was predominately between the 20 and 80 mesh sieves. Only 2.3 per cent was retained on the No. 20 and 4.9 per cent passed the No. 80 sieve, The mix was set for 7.0 per cent asphalt, 0.42 per cent powdered rubber and 92.58 per cent aggregate.

The mix was produced in a "Simplicity" plant of the stationary pug mill type. Rubber powder for each batch was weighed and placed in a bag from which it was dumped into the pug mill along with the dry aggregate which had been heated to 300 to 325°F. After mixing the aggregate and rubber for 15 seconds, the asphalt (heated to 215°F.) was added and mixing continued for an additional 45 seconds. It was attempted to produce the mixture with a temperature of 260°F. but due to breakdown of equipment and delays there was considerable variation.

The existing surface was cleaned and a tack coat of AP-3 asphalt (85-100 penetration) was applied at the

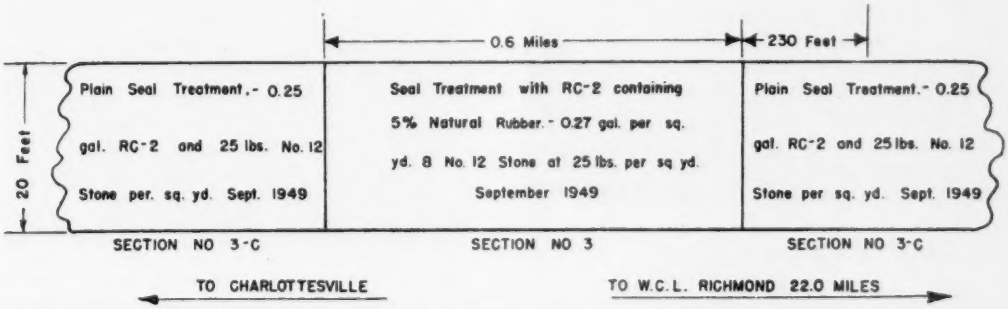
0.6 Miles
230 Feet
20 Feet
Plain Seal Treatment.- 0.25 gal. RC-2 and 25 lbs. No. 12 Stone per. sq. yd. Sept. 1949
Seal Treatment with RC-2 containing 5% Natural Rubber.- 0.27 gal. per sq. yd. & No. 12 Stone at 25 lbs. per sq yd. September 1949
Plain Seal Treatment.- 0.25 gal. RC-2 and 25 lbs. No. 12 Stone per sq. yd. Sept. 1949
SECTION NO 3-C
SECTION NO 3
SECTION NO 3-C
TO CHARLOTTESVILLE
TO W.C.L. RICHMOND 22.0 MILES

FIG. 2—Field experiments with rubber in bituminous seal treatment, Route 250, Goochland County, Va.

FIG. 3—Laying H-2 binder course with Barber-Greene paver prior to placing Type F-1 rubber asphalt surface. Note asphalt tack coat on pavement ahead of paver.

rate of 0.065 gal. per sq. yd. This was followed by a bituminous concrete binder course (H-2) applied at 127.5 lb. per sq. yd. (Figure 3). As soon as the binder course was completed in each lane of Section 1 it was covered immeditely with the bituminous concrete (F-1 sand asphalt) wearing surface containing rubber (Figure 4). An attempt was made to lay the wearing course as thin as possible. Average amounts were 62.5 and 65.5 lb. per sq. yd. for Sections 1 and 1-C, respectively. Both courses were placed with a Barber Greene paver and rolled with seven and twelve-ton tandem rollers.

Sections 2 and 2-C: Section 2, 500 feet in length, was constructed of Type F-1 sand asphalt containing reclaimed rubber. It is located about 0.5 miles west of Section 1. The old pavement was also a macadam road which had an old plant-mix surface. For the year ending June 30, 1949, it carried an average 24-hour traffic volume of 2919 vehicles, 746 of which were trucks and buses.

On this project, the aggregate (⅜ in. maximum size) was a mixture of ⅔ natural sand and ⅓ crushed gravel. As the rubber-asphalt section was only a small part of a large project, the mix had been designed and a considerable amount of material placed before the section containing rubber was constructed. An asphalt (AP-3) content of 6.5 per cent had been found to be the most desirable for the aggregates being used. Since the grading of this aggregate was about the same as the aggregate used in Section 1, a rubber content of 6 per cent by weight of asphalt was used. The reclaimed rubber was much coarser than the natural rubber. It was predominately between the 10 and 40 mesh sieves. Only 0.2 per cent was retained on the No. 10 and 6.0 per cent passed the No. 40 sieve.

This mix was also produced in a "Simplicity" plant of the stationary pug mill type. Rubber was weighed, added to the hot dry aggregate and mixed as described for Section 1. However, in order to produce the mix with a temperature of 275 to 285°F. the asphalt was heated to about 270°F.

After the surface of the road was cleaned, a tack coat of 0.059 gal. per sq. yd. of AP-3 was applied. Since no binder course was used on this project the F-1 mixture containing reclaimed rubber was placed on the tack coat at the rate of 124.7 lbs. per sq. yd. The regular F-1 surface course (without rubber) on either end of the section containing rubber was designated as Section 2-C (control section). These mixtures were placed with an Adnun paver (Figure 5) and rolled with eight and ten ton tandem rollers.

Sections 3 and 3-C: Section 3, which is 0.6 mile in length, is on U. S. Route 250 about 22 miles west of Richmond. It consists of a seal treatment of cut-back asphalt (RC-2) containing natural rubber and No. 12 stone chips placed on a 20-foot macadam road that had an old broom-drag surface treatment. The average 24-hour traffic volume for the year ending June 30, 1949, was 1500 vehicles, 423 of which were trucks and buses.

Approximately 600 gals. of cut-back asphalt (RC-2) was placed in a 1000 gal. distributor and heated to 180°F.

FIG. 4—Placing Type F-1 surface containing natural rubber with Barber-Greene paver. Note slight "pulling" of uncompacted surface. Picture shows completed westbound and eastbound lanes where binder course has not been applied.

FIG. 5—Placing Type F-1 surface containing reclaimed rubber with Adnun paver. Note absence of "pulling" in uncompacted material.

Powdered natural rubber in the amount of 5 per cent by weight was slowly added and agitated (Figure 6) until thoroughly mixed. Two mixings of powdered rubber and cut-back asphalt were necessary for each lane. While the rubber mixed with the asphalt readily, the operation required considerable time so that progress of the work was retarded.

When the rubber was uniformly mixed with the asphalt, it was applied on the road at the rate of 0.27 gal. per sq. yd. (Figure 7) and covered with about 25 lbs. per sq. yd. of No. 12 crushed stone (⅜ in.-No. 8). The stone was then rolled with a 7½-ton tandem roller followed by a rubber-tired roller. When rolling was completed the treatment was allowed to cure for a minimum of 1½ hours before it was opened to traffic. Again, this section was a part of a large project and the regular surface without rubber was used for a control section (3-C).

Observation and Records During Construction

During the progress of construction, the temperature and workability of the various F-1 mixes were carefully observed and recorded. Temperature of the material was taken at the plant when it was being weighed and again on the road when the material was placed in the paver. There was considerable variation in temperatures between different loads of material and between different batches in the same load. This variation was attributed to failure of equipment or other delays which caused the aggregate to remain in the drier for a longer period than usual and in some cases to the aggregate being put through the drier too rapidly. Some temperatures at the plant were probably low due to removal of the thermometer from the mix before maximum temperature had been recorded. On Sections 1 and 1-C temperatures recorded at the plant averaged 250°F. and on the road 248°F. The average recorded from Sections 2 and 2-C were 272°F. at the plant and 276°F. at the paver.

The type F-1 mix containing natural rubber was placed very readily with the Barber-Greene paver. It was found, however, that in order to prevent "pulling", the machine had to be operated slower (8 ft. per min.) with rubber than without (12 ft. per min.). An attempt was made to place the rubber-asphalt mixture at the rate of 50 lbs. per sq. yd. instead of the 62.5 lbs. obained. It is believed that with a smoother binder, trained operators, and a machine in good adjustment it would be feasible to place this material at rates as low as 50 lbs. per sq. yd.

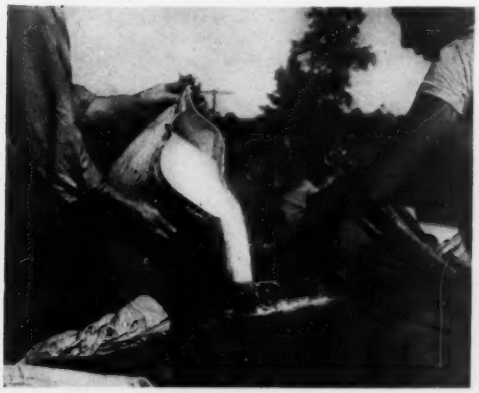

FIG. 6—Mixing powdered natural rubber with asphalt (RC-2) in distributor. The rubber was added slowly, stirred with a paddle, and agitated by the distributor.

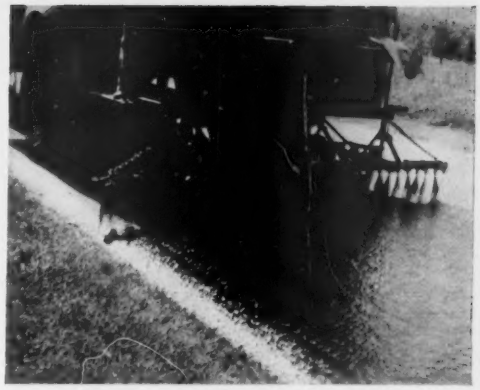

FIG. 7—Applying mixture of powdered natural rubber and asphalt (RC-2) with power distributor. Note that no difficulty was experienced with clogging of the nozzles.

With the type F-1 mix containing reclaimed rubber no difficulty was encountered in placing the material with the Adnun paver. The machine could be operated just as rapidly with the rubber-asphalt mixture as with F-1 without rubber. There was very little "pulling" in evidence with the reclaimed rubber. Immediately after rolling, particles of rubber were visible above the compacted surface; however, most of these particles appeared to be whipped off under traffic.

The rollers worked equally well on both materials. Good compaction was obtained with little or no pushing in front of the roller. There was no delay in rolling the sections containing rubber and while the surface was new it appeared to scar less under traffic than the surface without rubber.

On Section 3, where natural rubber was mixed with asphalt (RC-2) in the distributor, it was necessary to add the rubber slowly, stir with a paddle and agitate the asphalt with the distributor. When it was thoroughly stirred the rubber mixed readily with the asphalt. The volume of the asphalt was increased about 10 per cent by the addition of 5 per cent of rubber by weight.

The power distributor applied the rubber-asphalt mixture without difficulty. Even distribution of the material on the road was obtained with no clogging of the nozzles that could be attributed to the presence of the rubber.

Many photographs were taken during the construction of each section. In addition, moving pictures were made during construction and while performing skid-resistance tests on Section 1. These pictures show many construction details that will be of value in future studies.

Follow-Up Studies

Since construction, follow-up studies of the experiments have included visual observations, road roughness measurements, and skid tests.

Visual Observations: Visual inspections are made frequently of each section, but to date there has been

TABLE I—SKID RESISTANCE MEASUREMENTS

Section Number	Surface Condition / Speed—M.P.H.	Dry 10 S	Dry 10 f	Dry 20 S	Dry 20 f	Dry 30 S	Dry 30 f	Dry 40 S	Dry 40 f	Wet 10 S	Wet 10 f	Wet 20 S	Wet 20 f	Wet 30 S	Wet 30 f	Wet 40 S	Wet 40 f	Date Tested
	Bituminous Concrete, Sand Asphalt (F — 1)																	
1-C	Without Natural Rubber	4.8	0.69	18.2	0.73	37.4	0.80	63.4	0.84	4.9	0.68	21.3	0.63	49.9	0.60	93.7	0.55	May, 1949
1	With Natural Rubber	3.7	0.90	17.2	0.78	38.9	0.77	60.7	0.88	5.1	0.65	21.1	0.63	49.1	0.61	87.9	0.61	May, 1949
	Difference in S	1.1		1.0		—1.5		2.7		—0.2		0.2		0.8		5.8		
1-C	Without Natural Rubber	4.5	0.74	19.6	0.68	40.1	0.75	65.9	0.81	6.0	0.56	25.5	0.52	57.0	0.53	101.2	0.53	Nov., 1949
1	With Natural Rubber	4.2	0.79	18.6	0.72	40.2	0.75	66.6	0.80	5.1	0.66	22.6	0.59	49.2	0.61	87.5	0.61	Nov., 1949
	Difference in S	0.3		1.0		—0.1		—0.7		0.9		2.9		7.8		13.7		
2-C	Without Reclaimed Rubber	4.5	0.74	18.3	0.73	40.1	0.75	64.7	0.82	5.3	0.63	22.6	0.59	49.8	0.60	88.2	0.60	Nov., 1949
2	With Reclaimed Rubber	4.4	0.76	18.6	0.72	40.5	0.74	67.9	0.78	5.4	0.62	21.5	0.62	48.8	0.61	88.5	0.60	Nov., 1949
	Difference in S	0.1		—0.3		—0.4		—3.2		—0.1		1.1		1.0		—0.3		
	Seal Treatment																	
3-C	Without Natural Rubber	5.0	0.67	20.4	0.65	44.2	0.68	73.5	0.72	5.9	0.56	24.3	0.55	55.0	0.55	93.1	0.57	Nov., 1949
3	With Natural Rubber	4.2	0.79	19.3	0.69	41.0	0.73	71.7	0.74	5.6	0.60	24.0	0.54	53.0	0.57	90.0	0.59	Nov., 1949
	Difference in S	0.8		1.1		3.2		1.8		0.3		0.3		2.0		3.1		

S = stopping distance in feet.

f = average coefficient of friction, as determined from $f = \frac{v^2}{30S}$ where v = velocity in M.P.H.

Note: Each stopping distance value is the average of two or more determinations.

no noticeable difference in appearance between the sections containing rubber and their respective control sections, except as previously described for Sections 2 and 2-C. These inspections will be continued and complete performance surveys made when pronounced differences are apparent.

Road-Roughness Tests: Road-roughness measurements were made on Sections 1 and 1-C in June, 1949, with the single wheel type of road roughness indicator designed by the Bureau of Public Roads *(7)*. The section containing natural rubber with an average roughness index of 98 in. per mi. was slightly rougher than the control section which had an average roughness index of 92 in. per mi. This difference is small and since considerable difficulty was experienced in keeping the paver properly adjusted it is believed that differences in roughness may have resulted from operation of equipment rather than from the presence or absence of rubber in the mix. It was found that a greater difference existed between the outside lanes and the inside or passing lane. For example, the outside lanes averaged 103 in. per mi. and the center lane 79 in. per mi.

The other sections have not been tested for riding qualities; however, it is planned to make these measurements as soon as possible.

FIG. 8—Skid tests on sand asphalt surface. Note mark on pavement and dust from chalk bullet fired by detonator as wheels were locked.

Skid Resistance Tests: One of the benefits claimed for the use of powdered rubber in asphalt mixtures is improvement in skid resistance of the surface. In order to evaluate this quality, skid resistance tests *(8)* have been made on each section. Results shown in Table I are the average of two or more tests made at each speed for each surface condition. The individual measurements checked very closely with repeat tests under the same conditions.

Skid resistance tests (Figure 8) were made on Sections 1 and 1-C in May, 1949, soon after completion. At that time, with the surface in a wet condition at 40 m.p.h. an average stopping distance of 93.7 ft. was measured on the plain surface and 87.9 ft. was measured on the F-1 surface containing natural rubber. The difference of 5.8 ft. in favor of the mix containing rubber indicates that natural rubber in F-1 mixes tends to improve skid resistance of the surface at early ages.

Sections 1 and 1-C were again tested for skid resistance in November, 1949. These tests at 40 m.p.h. on wet surfaces gave an average stopping distance of 101.2 ft. on the plain section and 87.5 ft. on the one containing natural rubber. Results of these tests are shown graphically in Figure 9 in comparison with the AASHO recommended maximum safe stopping distances. It will be noted that even for the wet surface without rubber the stopping distance is well below the recommended maximum safe stopping distance of 113 ft. at 40 m.p.h. The above tests show that while the skid resistance of the section containing natural rubber remained the same six months after construction, there was an increase in stopping distance on the plain section.

Results of skid resistance tests at 40 m.p.h. on Sections 2 and 2-C gave an average stopping distance of 88.5 ft. on a wet F-1 surface containing reclaimed rubber and 88.2 ft. on a wet F-1 surface without rubber. These results indicate that, at the time the tests were conducted, the reclaimed rubber had not been effective in improving skid resistance of this F-1 surface.

Skid resistance tests on Section 3 at 40 m.p.h. with the surface in a wet condition gave a stopping distance of 90.0 feet on the seal treatment containing natural rub-

ber and 93.1 feet on the seal treatment without rubber. The difference of 3.1 feet in stopping distance is small and may have been affected by the surface texture which is rather harsh. Tests will have to be conducted over a longer period of time to evaluate any improvement due to rubber in this type of surface.

Figure 10 shows graphically skid test results to date. It will be noted that all surfaces tested have good skid resistance even in a wet condition and are well below the maximum safe stopping distance as recommended by the AASHO. With the surfaces in a dry condition, stopping distances for the various F-1 surfaces are very close together. On the seal treatment, there is very little difference between the stopping distance for the sections with and without rubber. Since results of a large number of tests on surfaces of various types show that all pavement surfaces in Virginia have good skid resistance in a dry condition, only results of tests on wet surfaces at 40 m.p.h. are used to evaluate their skid resistance.

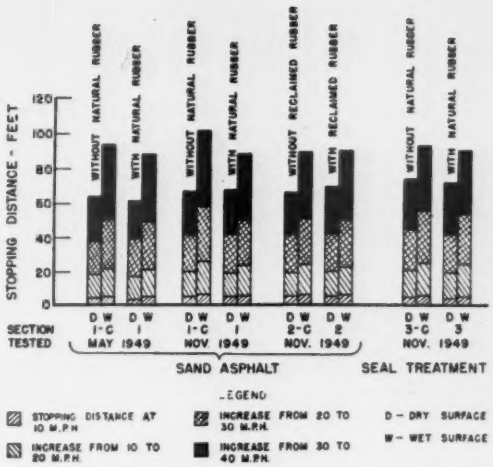

FIG. 10—Skid resistance measurements.

Summary of Results

While definite conclusions regarding the economics and durability of sand-asphalt (F-1) bituminous plant mixes and seal treatments to which small percentages of natural or reclaimed powdered rubber have been added cannot be made at this early date, the following tentative conclusions appear to be justified.

1. It is feasible to incorporate small percentages of natural or reclaimed powdered rubber in sand-asphalt (F-1) mixes at the plant and in the manner followed in these experiments. Also, no difficulty was encountered in adding a small percentage of powdered natural rubber to asphalt cut-back (RC-2) and applying it with a distributor. No method was devised to determine the distribution of the rubber throughout the mix, and consequently no data is available on this feature.

2. It was found to be practical to lay such a mixture with Barber-Greene and Adnun pavers. With the equipment available, however, the thinnest rate of application that could be applied successfully was approximately 60 lbs. per sq. yd. It was further found that with the natural rubber in the mixture the maximum speed of the Barber-Greene paver for good results was about 8 feet per minute while without the rubber a speed of 12 feet per minute could be maintained with equally good results. Reclaimed rubber in the mixture did not affect the results obtained with the Adnun paver.

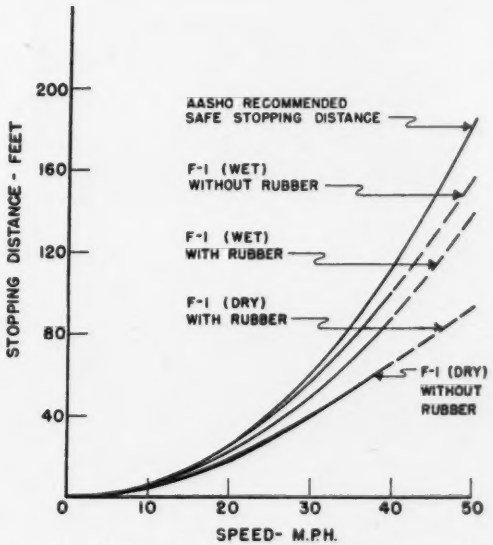

FIG. 9—Skid test results on bituminous concrete (Type F-1) surfaces with and without natural rubber (six months after construction).

3. No visible difference in appearance has been observed between the sections with natural rubber and the ones without. The surface containing reclaimed rubber showed particles of rubber standing above the compacted surface when rolling was completed.

4. Since the natural and reclaimed powdered rubber was furnished gratis to the Department, no information is available concerning added costs for these materials.

5. Immediately after construction measurements of resistance to skidding indicated that in a wet condition the section of F-1 sand-asphalt with natural powdered rubber had slightly better resistance to skidding than the control section. In a dry condition there was very little difference between the stopping distance on the sections with and without natural rubber. Similar tests, six months later, on the wet surface showed an increase in stopping distance for the control section, but no change in the skid resistance of the rubber-asphalt surface.

6. After two months there is no indication that the reclaimed rubber has been effective in improving skid resistance of type F-1 sand asphalt. Skid resistance measurements on the section with reclaimed rubber were about the same as those for the control section.

7. A slight difference in stopping distance on a seal treatment with and without natural rubber was indicated in favor of the rubber section, two months after construction.

8. The outside lanes which carry the majority of traffic were found to be rougher than the inside or passing lane; however, no differences were found in the riding qualities of Sections 1 and 1-C that could be attributed to the presence or absence of rubber in the mix.

9. Based upon experience with similar sand-asphalt mixes not containing powdered rubber, it is believed that several years will be required before decided differences in performance on these sections may be apparent. It is believed that where small percentages of powdered rubber are incorporated with the asphalt and applied in conjunction with a seal treatment, then an evaluation of the effectiveness of the rubber-asphalt combination may be possible at a much earlier date.

In conclusion it is suggested that comprehensive laboratory research be conducted to determine fundamental properties of rubber-asphalt mixtures.

ACKNOWLEDGMENTS

The authors wish to acknowledge, with sincere appreciation, the help given by all of those who have assisted in experimental field projects which were initiated and authorized by General J. A. Anderson, Commissioner, and constructed under the general supervision of Mr. C. S. Mullen, Chief Engineer. The work was planned and executed through the cooperation of the Division of Tests, the Maintenance Division, the Virginia Council of Highway Investigation and Research, the Rubber Development Bureau and the Midwest Rubber Reclaiming Company.

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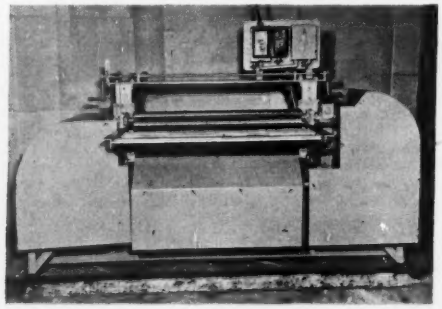
Falls Tile Cutting Machine

A power-driven floor tile cutting and blocking machine designed for use by flooring material dealers is being manufactured by the Falls Engineering and Machine Co., Cuyahoga Falls, Ohio, from designs furnished by the Campbell Machinery Development Co. The dealer model will cut 400 to 500 nine-inch tiles an hour. The

machine has a clamping bar with self-adjusting shoes which firmly hold the tile strips the full length of the bed of the machine. This eliminates stock slipping and makes precision accuracy possible when cutting strips or blocks. It will take roll or slab stock to 38 inches wide and ¼-inch thick and will cut blocks from 4 to 24 inches in increments of 1 inch. Combinations of oblong blocks may be cut to 24 inches and the machine will cut feature strips to 36 inches in length and from ½ to 1½ inches wide. The power-driven cutting head can be stopped or started by slight pressure of a foot pedal. The operator's hands are free to hold or help guide the stock. The operator can also make continuous or single cuts, as desired. The company also has available a larger model for use by rubber and plastic tile manufacturers.

Hoff Splitter Model No. 43

Designed to split sponge and foam rubber to the thickness desired in the fabrication of certain rubber products, the Model No. 43 Splitter manufactured by the Hoff Manufacturing Co., Mansfield, Ohio, will split foam rubber down to a thickness of .062-inch with a tolerance of plus or minus .010-inch. Of the two models presently



available, one will split rubber up to 43 inches wide and 8 inches thick, and the other will split up to 60 inches wide and 8 inches thick. The basic design of this splitting machine is that of a band saw laid on its side. Instead of a toothed saw an endless band knife with a razor sharp edge is used. The machine has four speeds on the feeder rolls from 12 feet per minute up to 20 feet per minute. The material can be split either in sheets or rolls. All adjustments, especially those pertaining to the setting of the rolls for feeding the material, have micrometer movement. Running gears are enclosed in sealed gear cases and all moving parts and shafts are mounted on ball bearings for long life. The feeder rolls have an especially attractive feature, i.e., by the flick of a lever the rolls will reverse themselves and the material will back out. This feature was incorporated in the machine to save material by being able to check the setting of the feeder rolls before running all the material through.

Development of Machinery For Curing Tires

By L. E. SODERQUIST
McNeil Machine & Engineering Co., Akron 11, Ohio

SINCE the inception of the first pneumatic tire, there has been a program of constant research to improve tire quality. Keeping stride with this improvement, the engineer, with all the technical help that he can muster from other arts, has been constantly striving to improve the machines used in the manufacture of tires. This article deals primarily with the development of the latest tire curing press, known to the trade as the McNeil "Bag-O-Matic." This new machine, with one sequence of operation, bags, cures and de-bags, an operation which normally takes three separate machines with three separate operators. Not only does the Bag-O-Matic combine these operations, but it does them in approximately one-half the time normally required on the three units.

To fully explain the development of this new unit, it seems best to briefly review some of the past history of the machines used in the making of tires. Of course, all of the methods used will not be explained, nor will methods used prior to 1915 be elaborated upon. However, a typical method once used by one of the larger rubber manufacturers will be considered in some detail. This story will be presented in three phases of tire manufacturing. The first phase will cover the years from 1915 to approximately 1925. The second phase will cover the period from 1925 to the present. The third phase will cover the Bag-O-Matic method and what seems to be the future method.

First Phase

In the early days, the manufacturer attempted to maintain the finished shape of the product during all construction operations. The tire carcass was built on a collapsible metal core, the core having a shape similar to the inside of a finished tire. The bead wires and various rubber and fabric plies were built up on this metal core. This tire was made smooth without any nonskid tread and was semi-cured in a split smooth mold with the metal core remaining in position during the curing operation.

After the preliminary cure, the core was removed from the casing and a rubber curing bag somewhat heavier than an inner tube was inserted into the tire by hand. Steel rings or side plates were hand-bolted together to hold the shape of the beads and to retain the bag within the tire. This assembly was then placed on a machine for cementing a pre-cured tread onto the pre-cured tire carcass. This nonskid tread was made in a separate mechanical mold. After the installation and final inspection of the nonskid tread, the tread recesses were filled by hand with a plasterlike soapstone material. A cloth binder was placed over the carcass and then the whole unit—bag, casing and ring—was rag-wrapped mechanically with long spiral wrappings. After the tire was securely wrapped, it was moved to a rack-like truck and each tire was inflated to approximately 100 lbs. pressure. The tires were then ready to be placed in a long, horizontal vulcanizer and given the final cure.

These horizontal vulcanizers were later replaced by what is known as vertical pot heaters. The vertical pot heaters were equipped with a hydraulic ram so that the individual molds could be stacked on top of the ram and held together by the pressure of the ram. At the termination of this horizontal vulcanizing cure, which was approximately two hours, the tires were cooled, deflated and the rag wrappings removed manually. This unwrapping operation was quite a task and often the laborers would be burned by falling bits of dried soapstone. The next operation was the unbolting of the clamping rings and the removal of the curing bag. The soapstone was then removed from between the nonskid crevices. The tire was cleaned, finally inspected and ready to ship.

Second Phase

About 1925, the art of tire building and curing entered a new era. The idea of building the casing to the shape of the finished product was discarded in favor of the drum built tire. In this method, the casing is built on the flat side of a cylindrical, collapsible drum. Due to the refinements in the technique of manufacturing molds, the nonskid tread no longer had to be molded separately and applied to the tire. The green stock composing the nonskid tread was built right on the casing during the drum building. This eliminated any intermediate operations and many hand operations. The building machines were made partly automatic, and again, many of the hand operations were eliminated,

With the era of the tire being built flat or barrel-shaped, it had to be shaped to the similarity of the finished product without vulcanization. This pre-forming is known as the bagging operation. Here the tubular casing is placed on end in a pneumatic press after an air bag, which is quite like an inner tube in appearance, has been inflated and drawn into the cavity in the platform of the press. With the unshaped tire centered on the platform above the cavity containing the air bag, the ram pushes down on the casing bulging out the tread portion. Simultaneously the air bag is forced out of the cavity and into the tire. The casing is now ready for the vulcanizer.

During approximately the same period of time, the pot heater type vulcanizers were being discarded in favor of the individual vulcanizer. In pot heater vulcanizers, the molds had to be handled in and out of the heater with overhead equipment. This meant that the mold had to be out of production a considerable length of

Note: This article is based on a talk given by the author at the September, 1949, meeting of the Rubber and Plastics Division of the American Society of Mechanical Engineers at Erie, Penna.

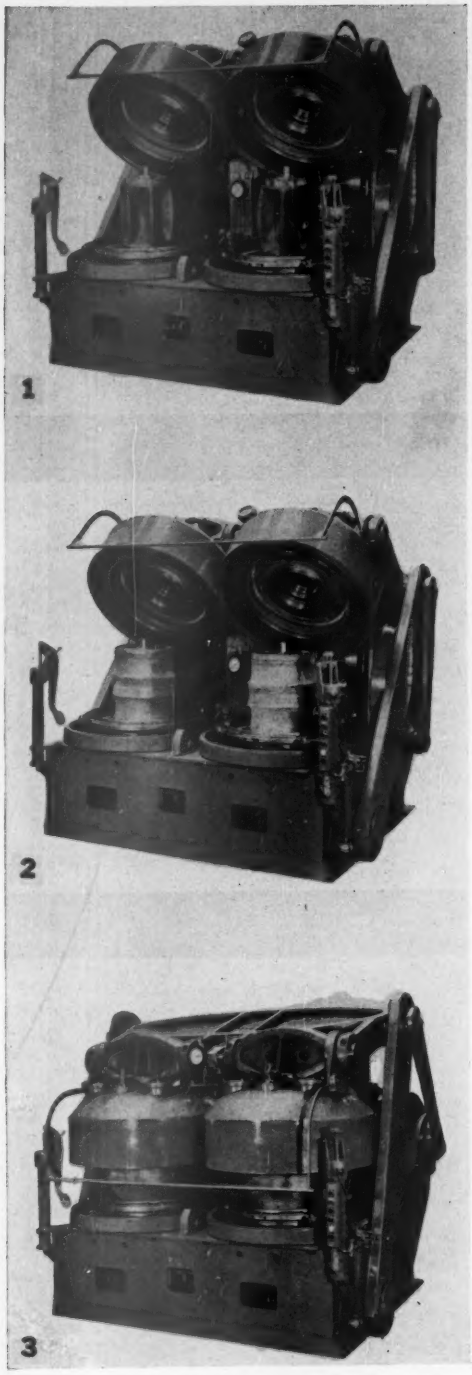


FIG. 1—View of the Bag-O-Matic press open with the curing bladders collapsed, ready to accept green tires. FIG. 2—Here the green tires have been placed over the curing bladders before the press is put into operation. FIG. 3—When the press begins to close it simultaneously expands the bags and tires into the molds.

time, causing a very appreciable loss of heat. In the individual vulcanizer, the mold stayed in the vulcanizer and remained hot. The only loss of time was the removal of the cured tire and the reloading of the green tire into the press. The placing of the shaped carcass in the individual vulcanizer was an easy matter. The removal of the tire after it had been vulcanized presented a very difficult problem. Chain hoists, hand paddles and various types of bull rings were used in an attempt to ease the difficulty.

In 1938, the McNeil Company introduced the shear action vulcanizer. This vulcanizer closed with the top mold being held in a horizontal plane traveling down in a straight vertical action. After the vulcanization of the tire, the top half opened approximately ¼" straight up. From this point instead of a straight line action, the mold sheared toward the rear of the press automatically at a 45° angle. This shearing action removed the tire from the mold. This was a major development and saved the tire press operators from the backbreaking labor of removing tires.

After the removal of the vulcanized tire, the tire, with the curing bag still in position, was placed on a conveyor and sent to the debagging machine. The debagging machine grabs the curing bag in a pair of iron jaws and removes it from the finished tire by brute force. From here the tire goes on to final inspection and the curing bag moves by conveyor through the treating units where it is given various applications of lubricants and heating treatments so that it may again be used for the curing of other tires. It will be noted that in the second phase of tire building and curing, many of the previous operations have been eliminated.

Third Phase

In this final phase, the operations as previously described are all accomplished on two machines. The tire building machine is still a flat drum type; however, many refinements have been incorporated which has made this machine semi-automatic. When the finished drum built tire is removed from the building machine, the casing moves directly by conveyor to the Bag-O-Matic vulcanizer. Figure 1 shows the Bag-O-Matic press open with the curing bladders collapsed, ready to accept the green tires. The tires are placed on the cylindrical shaped bag that is an integral part of the vulcanizer, as shown in Figure 2. The starting button on the machine is pressed by the operator and the machine proceeds to close and simultaneously expands the bags and tires into the molds, as shown in Figure 3. The press closes completely with a parallel action and remains closed until the termination of the cure (see Figure 4).

The curing cycle in the Bag-O-Matic is approximately 50% to 60% of that required by any other previous method. This reduction of curing time is due to the fact that the bag being an integral part of the machine remains continuously hot. By using a bag of this design, it is possible to obtain a large inlet and outlet orifice which is capable of carrying large volumes of steam or hot water into the curing bag very rapidly and also exhaust rapidly. Due to the fact that the Bag-O-Matic bag has a thinner section than the conventional type, much less heat is required to bring the tire to curing temperature. After vulcanization the press opens and automatically the bag is extracted from the tire (see Figures 5 and 6). The tire is then completely cured, debagged and ready to be removed by the operator. The press is then ready to be reloaded. The cured tire as removed is then ready to move on to final inspection.

It will be noted that from the building stage to the finished tire there are only two distinct operations. The Bag-O-Matic has eliminated entirely the necessity of pre-shaping, bagging, debagging and bag treatment as described in Phase 2.

Comparison of Curing Methods

In the second phase of curing, the bag and tire must be handled five times by the operator. This makes a total weight of approximately 350 pounds in the curing of a 7.60-15 passenger tire. In the Bag-O-Matic method, the tire itself is only handled twice and for the same size tire this represents only 52 pounds of total weight. This illustrates very clearly the great difference in the amount of hand labor required.

The flexible type curing bag used on the Bag-O-Matic Press is a very radical departure from the conventional rubber curing bag. The conventional curing bag is shaped much like an inner tube, but is built of extremely heavy stock to withstand the abuse during the bagging and debagging operations. This conventional curing bag is relatively short-lived and requires many resurfacing, buffing and lubricating operations.

Reference to Figure 4 will show that in the left-hand front area of the press, the Bag-O-Matic type curing bladder is shown. It has the shape of a small, open-ended, rubber barrel sitting on end. When the bag is installed, the open ends are sealed off with the steel heads, which become combination bead and bag clamping rings. When the heads of the barrel are pressed together, with the addition of a small amount of internal pressure, the barrel-shaped bag will take a toris shape similar to the inside of the tire. This is the principle around which the Bag-O-Matic is designed and built.

The operation of this type of curing in its simplest form is as follows: With the heads of the barrel-shaped bag separated and mechanically held, a small amount of vacuum is applied to the inside of the bag. This collapses the sides and reduces the width of the bag. In this position, the cylindrical shaped green tire casing can very readily be slipped over the bag. As the press closes, the heads of the barrel are pushed together and pressure is automatically induced to the inside of the bag. This pushing together of the heads and the induction of pressure into the bag continues until the tire is shaped to the mold. When the molds are closed and held together by the press, high pressure, hot water or steam is then introduced to the inside of the bag forcing the tire into the mold and curing it to the mold design.

After completion of the cure, the pressure is exhausted, a vacuum is applied to the inside of the bag and the press is opened. During the opening of the press, the bag and heads are held to the bottom mold forcing the tire to strip from the top half of the mold. After the top half of the mold has moved vertically, a sufficient amount to insure stripping of the tire from the top mold, the bottom head is mechanically forced upward stripping the tire from the bottom mold. With the press open, it stops and a pneumatic cylinder forces the top head upward and separates the two steel heads extending the curing bag vertically. The bag returns to the hour-glass shape, then two mechanical arms reach under the tire removing it from the bag. The tire is then completely cured and ready for final inspection.

A bag of the type described must necessarily be flexed way beyond that required of the conventional type. During the early development of this machine, the chief concern was the life of the bag—how many tires can be made from the bag before it is scrapped?

(Continued on Page 548)

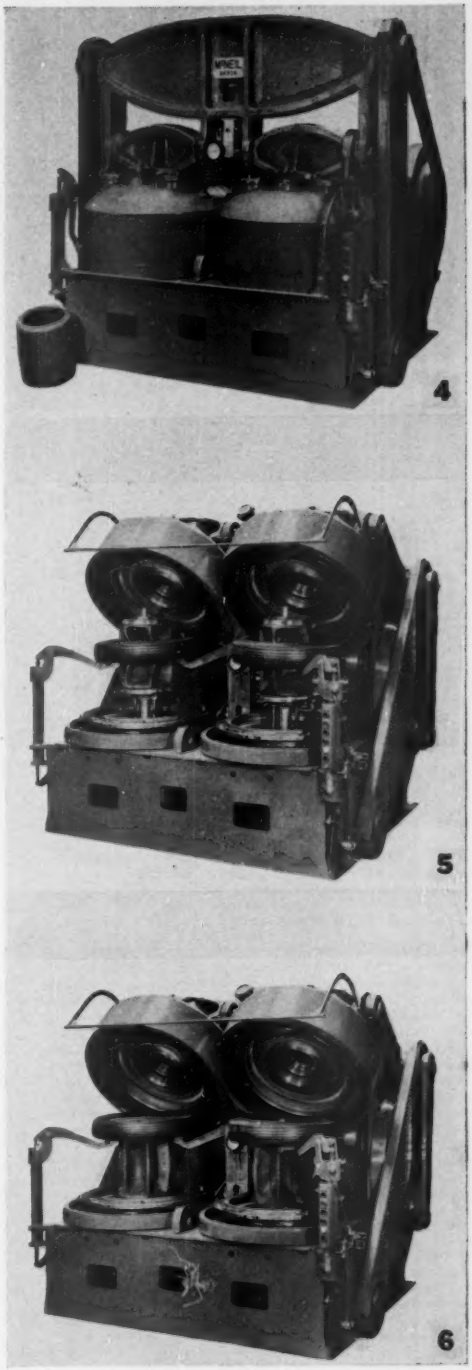


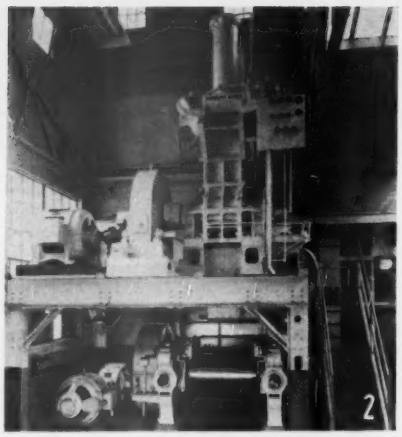
FIG. 4—The Bag-O-Matic press in closed position. The press closes completely with a parallel action. FIG. 5—After completion of the cure the pressure is exhausted, and the bladders collapsed by a vacuum system. FIG. 6—Here the tire is completely cured, debagged and ready to be removed from the mold by the operator.

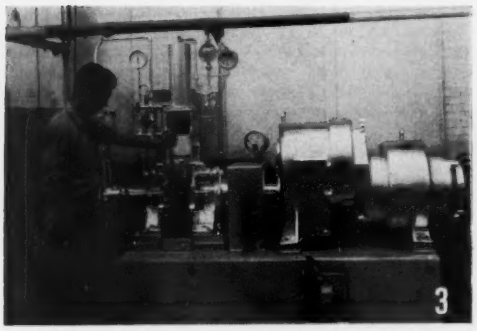
FARREL-BIRMINGHAM

WITH the recent addition of a new variable-friction mill, a four-roll Z-type calender, and other new equipment, Farrel-Birmingham Company, Inc., of Ansonia, Conn., has broadened the experimental range of its process-testing laboratory at its Derby plant.

Used for a number of years as a proving ground by rubber and plastics manufacturers, many new techniques have been developed in this laboratory that have helped to place on the market lower-cost, better-quality products of every-day use, such as automobile tires, linoleum, floor tile, plastic film products, phonograph records, paints, inks, and hundreds of others.

The laboratory contains numerous pieces of modern equipment, designed to help work out processing techniques before full scale production is begun. Interchangeable working elements for these machines, and a wide range of speeds and pressures, make a great variety of tests possible. Both laboratory size and production size machines are available, so that in many cases, after techniques





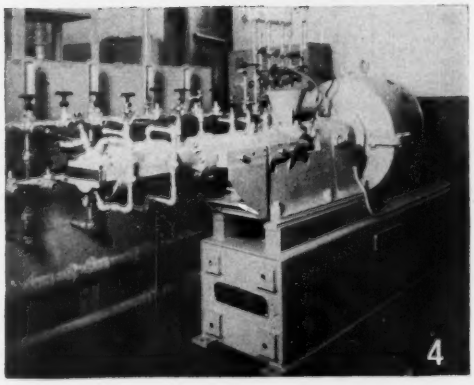


FIG. 1—General view of the Farrel-Birmingham process-testing laboratory at Derby, Conn. In addition to numerous laboratory-size machines, several production-size machines are installed, including a 3A Banbury mixer, a 22 x 48-inch two-roll mill, and a 21-inch and 24 x 36-inch tilted refiner.

FIG. 2—The size 3A Banbury mixer, installed on a mezzanine over the sheeting mill, can be used to evaluate tests in production-size batches. It has a capacity of 100 pounds of crude natural rubber, or gravity of the batch multiplied by 100. Driven by a 400 hp, DC motor, it has a range of rotor speeds from 10 to 108 rpm. An enlarged pressure cylinder and booster pump furnishes up to 160 pounds per square inch pressure on the bottom surface of the floating weight. Instruments record temperature and power consumption, providing a detailed record of each batch mixed. The 22 x 48-inch heavy-duty, two-roll mill, located directly under the Banbury mixer, can be used for sheeting out the stock from the mixer, or for other milling operations. The water-cooled roll bearings are flood-lubricated, and a cooler in the oil system makes it possible to operate continuously at temperatures as high as 350° F.

FIG. 3—The size B Banbury mixer has a capacity of 2 pounds of crude natural rubber, or gravity of the batch multiplied by 2. The mixer is driven by a four-speed motor and is equipped with an exceptionally large air cylinder for forcing stock into the mixing chamber. Means are provided for heating and cooling, and temperature and power consumption are recorded. The combination of different pressures with a considerable range of rotor speeds makes a variety of tests possible.

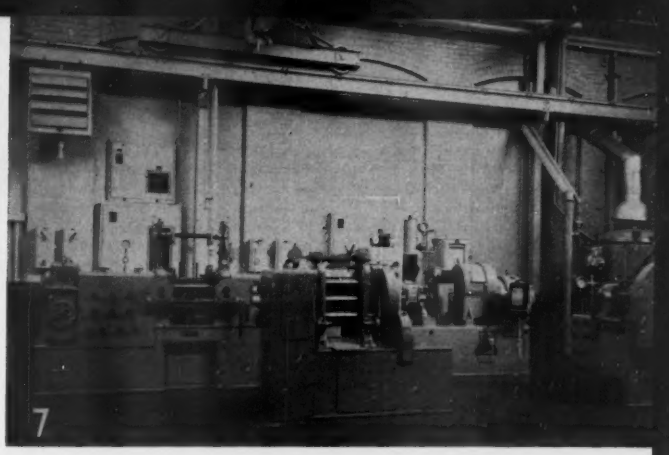
FIG. 4—The 3-inch plasticator-extruder has a large number of interchangeable cylinders, screws, heads and dies, so that it can be adapted to an extremely wide variety of applications, either as an extruder or continuous mixing unit. A DC motor gives screw speeds from 12 to 177 rpm. An electric oil-heating unit provides temperature control up to 500° F. for the five sections of the cylinder and head.

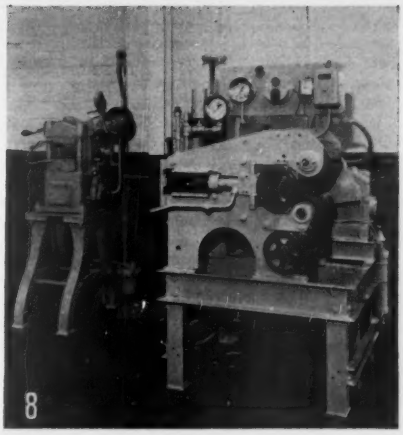
TESTING LABORATORY

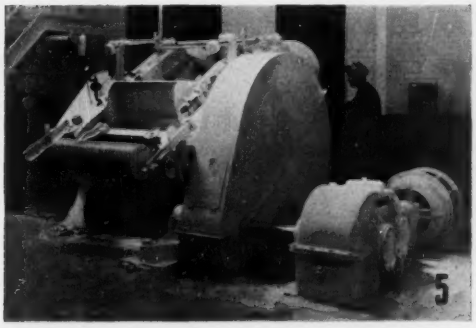
have been established on small machines, actual production evaluations of these tests may be made with full-size machines.

The facilities of this laboratory are offered without charge to manufacturers who may profit by their use. Included are the services of experienced operators and all necessary power, steam, water and compressed air. Materials to be tested are furnished by the manufacturer to preclude the possibility of unsatisfactory results due to variances in quality, characteristics or condition of ingredients employed in the tests.

To assure privacy, the use of the laboratory is generally restricted to one visiting party at a time. Exceptions are made, with the mutual consent of those concerned, when tests of a non-confidential nature on different types of machines can be scheduled together. Because of this policy, and because the laboratory is in use practically every working day of the year, it is necessary to make arrangements in advance and visits should be planned as far ahead as possible.







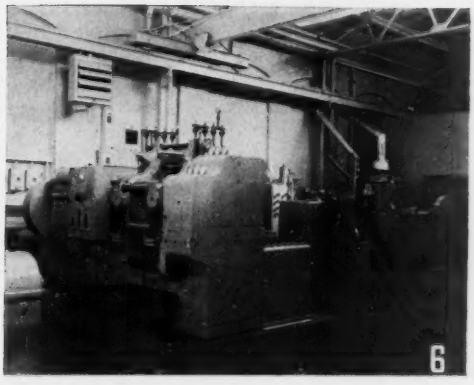


FIG. 5—The tilted refiner, which has 21-inch and 24 x 36-inch rolls, is driven by an individual motor and arranged to operate at either 20 or 61.44 rpm, with surface friction of 2½ to 1.

FIG. 6—The new 8 by 16-inch, four-roll, Z-type calender (left) is designed for high temperature operation. A variable speed gear motor for the main drive furnishes adjustable levels of speed for the entire roll assembly, and an arrangement of gears and clutches provides variables in roll speeds, one to another, so that by movement of clutch levers, the rolls may be set at related speeds determined to be most advantageous for film production, or for single or double coating. The laboratory refiner (right) has 5-inch and 7 x 13-inch rolls arranged horizontally, and is driven by a 7½ hp motor. The surface friction is 2.6 to 1, with a drive roll speed of 36 rpm.

FIG. 7—The new 8 x 16-inch two-roll mill (left) has several design innovations, one important feature being the individual drive for each roll. With either roll capable of running at any speed from 4 to 35 rpm, a wide variety of friction ratios is possible at different speed levels. Studies can now be made of the effect of different speeds and frictions on processing and quality. The three-roll laboratory calender (center) has 6 x 13-inch rolls powered by a 5 hp motor, which gives a drive roll speed of 13 rpm. The machine has even and friction gears, the latter providing a surface friction ratio of 1.4 to 1.

FIG. 8—Another new addition is the laboratory-size Rotocure (right), which is designed for continuous curing, laminating and surface-finishing of rubber and plastics products, such as belting, matting, packing and sheet material. The machine demonstrates, up to a width of 9 inches, the economy and simplicity of continuous operation, with the elimination of double cure around the overlap area where, by other methods, sections would have to be joined together. The laboratory hydraulic press (left) exerts a total pressure of 30 tons with a 3½-inch diameter ram.

Properties and Utilization of Polyacrylic Rubbers

By H. P. OWEN

B. F. Goodrich Chemical Co., Cleveland, Ohio

POLYACRYLIC rubbers and recently discovered methods for vulcanizing them make possible the fabrication of rubber products which will flex indefinitely, withstand hot oils and air at 300 to 350°F. for many weeks, have unlimited resistance to oxygen and ozone, and possess unsurpassed resistance to discoloration in sunlight. This inertness to factors which normally cause accelerated aging and deterioration of natural rubber, GR-S, oil-resisting nitrile rubber, GR-M and GR-I, hereafter referred to as conventional rubbers, has created widespread interest in these new polyacrylic rubbers and methods for utilization.

The four polyacrylic rubbers to be discussed are identified by the trade names Hycar PA, Hycar PA-11, Hycar PA-21 and Hycar PA-31. The purpose of this paper is to describe the properties of these elastomers and their vulcanizates, methods for attaining these properties and to suggest applications where they may be used advantageously.

Chemically, Hycar PA is an elastomeric polymer of an acrylic acid ester. Hycar PA-21 is a copolymer of an acrylic acid ester and a halogen-containing derivative. Elastomers similar to Hycar PA-21, one of which was called Lactoprene EV, were pioneered by the Eastern Regional Research Laboratories, U. S. Department of Agriculture *(1, 2)*. Hycar PA-11 is a modification of PA and Hycar PA-31 a modification of PA-21. They were developed specifically for easier processing and differ slightly in inherent characteristics such as solubility, curing rate and resilience.

Hycar PA and PA-21 require no milling to be readily soluble in many organic solvents such as toluene, methyl ethyl ketone, ethyl acetate, etc. In contrast, PA-11 and PA-31 form heavy gels, regardless of previous milling, in the same solvents; hence, they should be avoided in cement applications. Although insoluble in water, the polyacrylic rubbers tend to swell at room temperature and the tendency is accentuated as the temperature of the water is increased.

Latices of the four elastomers described are also available, but details as to their properties and applications are not within the scope of this paper. It will suffice to say that they are of considerable interest as impregnants and coatings due to their non-discoloring, adhesive, and age resistant properties.

Polyacrylic rubbers are chemically saturated; therefore, cross-linking or vulcanization cannot occur in the same manner as in the chemically unsaturated, conventional rubbers. Nevertheless, these thermoplastic polymeric materials are responsive to certain processes which convert them from thermoplastics to thermosets or cured products.

Note: This paper was presented at the 55th meeting of the Division of Rubber Chemistry, A.C.S., Atlantic City, N. J., September 21-23, 1949.

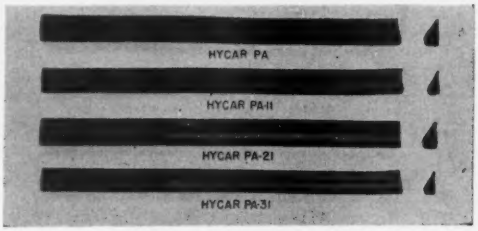


FIG. 1—Processing characteristics of the polyacrylic rubbers as determined by Garvey die extrusions.

TABLE I—TYPICAL RECIPES

Recipe No.	Hycar PA 1	Hycar PA 2	Hycar PA 3	Hycar PA-21 4
Type	Black*	White*	Black†	Black*
Elastomer	100	100	100	100
EPC Black (Wyex)	45	...	...	...
Sulfur	...	...	...	1
Waterground Mica	...	...	10	...
Treated Whiting (Witcarb-R)	...	30	20	...
HMF Black (Philblack-A)	...	...	50	50
Stearic Acid	...	...	...	1
Powdered Asbestos	...	30	...	...
Titanium Dioxide	...	10	...	...
Wool Grease	4	5	5	...
Hydrated Lime	4	4	3	...
Sodium Metasilicate-5H_2O	10	10	10	...
Tributoxyethyl Phosphate	...	...	10	...
Trimene Base	...	...	...	4
	163	189	208	156

* Molding. † Calendering and Extrusion.

Techniques for Good Vulcanizates

Before describing the properties of polyacrylic rubber vulcanizates, techniques for attaining good vulcanizates should be discussed briefly.

Numerous chemicals have shown varying degrees of curative action on Hycar PA and PA-11, but to date, sodium metasilicate pentahydrate *(3)* and litharge *(4)* have produced the most promising results. Where heat resistance is to be the prime service factor, sodium metasilicate pentahydrate is recommended since the state of cure attained with this agent is particularly stable in sustained heat service. Its curative action is augmented when used in combination with hydrated lime.

Normally, ten parts of silicate plus four parts of hydrated lime per hundred of Hycar PA (by weight) are used. This ratio will vary slightly with the state of cure desired. Since Hycar PA-11 has a faster rate of cure, the curatives should be reduced about 20% to impart equivalent heat resistance.

Hycar PA-21 and PA-31, in addition to responding to the curatives for PA and PA-11, can be vulcanized with numerous accelerators and curing agents used with conventional rubbers. For maximum heat resistance, com-

binations of sulfur and Trimene Base are used most frequently. Proportional change of these two agents in a stock will result in maximum stability of cure on prolonged exposure to high temperatures, i.e., if a certain stock tends to revert or soften at high temperatures, the amine should be increased and sulfur decreased, whereas, if the stock hardens, the reverse change is necessary.

In order to attain maximum effectiveness with polyacrylic rubbers, selective pigmentation is essential. Properties of polyacrylic rubber vulcanizates are much more sensitive to pigmentation changes than those of most conventional rubbers, principally because their vulcanization depends largely on maintenance of a basic pH in the uncured stocks. Fillers, reinforcing pigments, plasticizers, lubricants, etc., should be chosen with this in mind. Clays, acidic plasticizers or other pigments which absorb or react with bases should be avoided. Inert or slightly basic pigments are preferred.

With the exception of curative systems, compounding of the four elastomers is essentially the same. Although maximum heat resistance is attained with loadings of 25 to 30 volumes of dry pigments per 100 of rubber, many variations in the base recipes can be made to produce vulcanizates with optimum properties in particular fields.

Polyacrylic rubbers are inherently soft when vulcanized; therefore, the chief advantage of using plasticizers is to lower the brittle point. Hundreds have been tried, but with little success due to the following two reasons: (a) the majority react with the basic curatives, causing retardation or inhibition of the curing reaction, and (b) plasticizers which have been found to impart a marked reduction in brittle point are volatile at service temperatures of 300° F. or above. If plasticizers are absolutely necessary for a specific application, tributoxy ethyl phosphate or high molecular weight polyethers such as Thiokol TP-90B are recommended because of their closer conformance to the desired properties.

Blends of polyacrylic rubbers with other polymeric materials have been investigated only briefly. With respect to compatibility and non-interference of curative systems, GR-M seems best adapted of the conventional rubbers for this purpose.

Processing of polyacrylic rubbers requires a reasonable amount of care if ease in manufacture is to be obtained. Standard equipment for the rubber industry is used for processing and in much the same manner as for other rubbers, with these exceptions:

1. No breakdown period is required on a mill or in a Banbury.

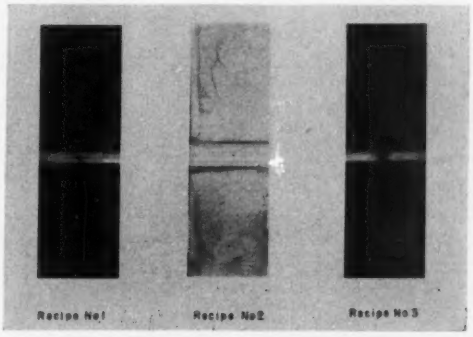


FIG. 2—Flex life and cut-growth resistance of Hycar PA determined on DeMattia flexing machine.

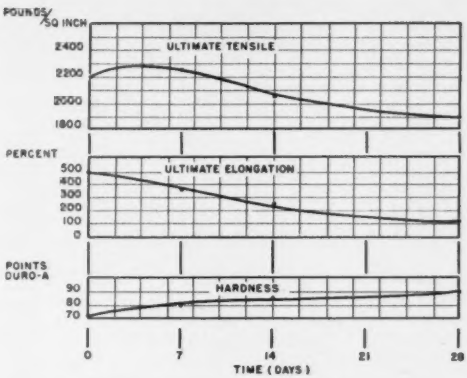


FIG. 3—Heat resistance of Hycar PA black molding compound (Recipe No. 1). Press cured 45 min. @ 310° F. Aged in circulating air oven @ 300° F.

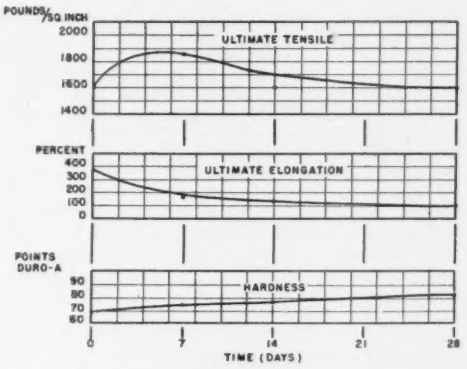


FIG. 4—Heat resistance of Hycar PA white molding compound (Recipe No. 2). Press cured 45 min. @ 310° F. Aged in circulating air oven @ 300° F.

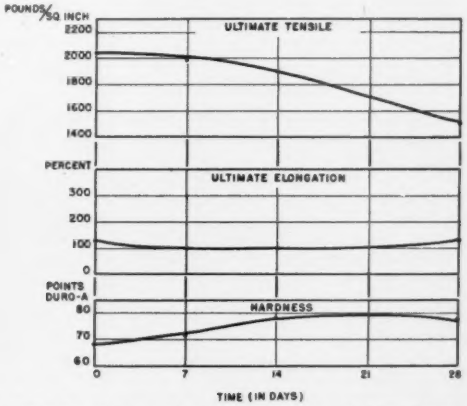


FIG. 5—Heat resistance of Hycar PA-21 black molding compound (Recipe No. 4). Press cured 45 min. @ 298° F. Aged in air oven @ 300° F.

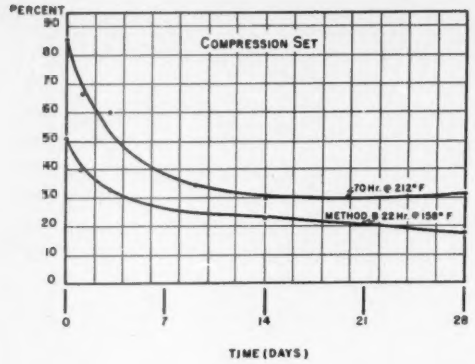


FIG. 6—Effect of aging in circulating air oven @ 300° F. on compression set properties of Hycar PA (Recipe No. 1). Press cured 60 min. @ 310° F.

2. During the addition of curatives to a batch, the temperature should be between 150 and 175° F.

3. Temperatures for calendering and extrusions must be maintained within a narrower range to prevent sticking and scorching.

4. Curing cycles are usually longer.

Vulcanization is accomplished in 30 to 60 minutes at 300 to 310° F. in pressure molds or an autoclave. Air cures are impractical if advanced states of cure are desired.

Regular methods for reducing cure times, such as adding more accelerator and curative, have thus far proved unsatisfactory due to deleterious effects on aging properties and if the temperature is raised to speed the cure, "scorching" becomes a problem and complicating reactions are more likely to be encountered.

Properties of the Polyacrylic Rubbers

Properties of the various polyacrylic rubbers have been determined on the basis of the compounding and processing techniques described. Figure 1 shows the processing characteristics of the four rubbers as determined by Garvey die extrusions, using the following recipe and an optimum curative system:

Elastomer	100
Philblack-A	40
Wool Grease	3

The smooth surfaces, sharply defined edges and low swell of the PA-11 and PA-31 samples are indicative of their better processing.

It should not be construed that the recipe employed is the best available for processing. It was merely selected at random to show a comparison of processing characteristics of the elastomers when compounded with equivalent loading and lubrication and their respective curative systems.

Various properties of Hycar PA and PA-21 are shown in Figures 2 to 7, based on the typical recipes listed in Table I. Figure 2 shows the phenomenal flex life and resistance to cut-growth of Hycar PA, compounded in Recipes 1, 2 and 3. The three grooved bars were press cured 60 minutes at 310° F., then pierced and flexed 5,200,000 times in a DeMattia Flex Machine. No growth of the .05-inch cut in the center of the groove can be noted after the tremendous number of flexures. Other samples have been reported to go 18,000,000 flexures without changing.

Figures 3, 4 and 5 show the excellent resistance of polyacrylic rubber vulcanizates to dry heat. Shown graphically are changes which occur in ultimate tensile strength, percent ultimate elongation and hardness during 28-day aging periods in a circulating air oven at 300° F. Tests were made on dumbbells cut from regular ASTM sheets and suspended 1, 2 and 4 weeks in a circulating air oven. The most heat resistant compounds of conventional rubbers within the rubbery range of hardness, when subjected to these conditions, lose the majority of their tensile strength and become either hard and brittle or soft and tacky in less than one week.

Graphs in Figure 3 show the effects of aging at 300° F. on Hycar PA, compounded in Recipe No. 1 and cured 45 minutes at 310° F. After aging 28 days, the vulcanizates were still flexible and retained 88% of their original tensile strength, 25% of the elongation and gained 18 points in hardness. Note that after 14 days the curves flatten out, indicating extended serviceability beyond the limits of the test period.

The same type of data as is shown in Figure 3 is displayed in Figure 4 for Hycar PA compounded in Recipe No. 2. This is a white stock and, as would be expected, the original physical properties are lower. However, the percent changes after aging 28 days at 300° F. are not as great as they are for the EPC black reinforced compound No. 1. This particular compound flows well in intricately designed molds and is recommended especially where thicker sections are desired.

Slopes of the curves plotted in Figure 5 show a distinguishing feature of Hycar PA-21 as compared to Hycar PA in that vulcanizates of PA-21 tend to retain their original elongation and hardness longer but lose a greater percentage of tensile strength on exposure to elevated temperatures. This may be desirable where a softer stock is needed over long periods of heat service. These data were obtained with Recipe No. 4 which is designed for a Hycar PA-21 molding stock. Low original elongation is due to the HMF black reinforcement.

Figure 6 concerns the compression set properties of Hycar PA compounded in Recipe No. 1. Recorded here are the changes which occur during the prolonged aging period described with Figures 3, 4 and 5. It is evident that air oven aging at 300° F. is quite effective in improving compression set properties which originally

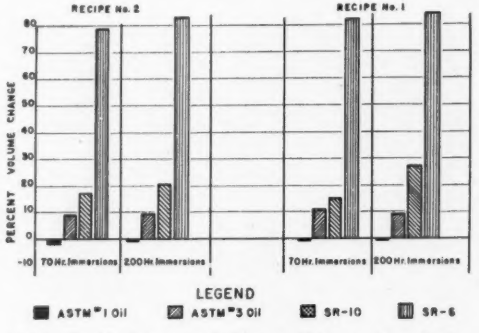


FIG. 7—Resistance of Hycar PA compounds to ASTM No. 1 and 3 Oils @ 300° F. and SR-6 and SR-10 Fuels at room temperature (Recipe Nos. 1 and 2). Samples cured 45 min. @ 310° F.

are relatively high. Indications are that this improved compression set can be attained in a few hours at 350° F. instead of the 2 to 3 days required at 300° F. It would appear that the stock is undercured originally; however, stress-strain data as were shown in Figure 3 seem near optimum after a normal curing cycle.

In view of the foregoing data, an air oven aging period for finished polyacrylic rubber articles requiring low set would be worth the time required.

Inertness of polyacrylic rubber vulcanizates to oils at temperatures of 300° F. and above is unexcelled in a rubber-like material. Their resistance to aliphatic hydrocarbons is also good. Graphed in Figure 7 are percent volume changes of Hycar PA compounded in Recipes 1 and 2, resulting from 70 and 200 hour immersions in ASTM No. 1 and 3 oils at 300° F. and Standard Reference Fuels SR-6 and SR-10 at room temperature. Only the aromatic-containing SR-6 shows any appreciable effect. Furthermore, we have found that service life of these rubbers in oils is even better than in air at a given temperature.

Since oxidation is not a factor in the aging of polyacrylics, this longer service life in oil is attributed to the seclusion from moisture laden air, which we believe is the principal cause of further cure at elevated temperatures.

Excellent heat and ozone resistance, coupled with fair electrical properties, render the polyacrylic rubbers suitable for special purpose wire insulation.

Figure 8 shows the effect of heat aging at 300° F. on the dielectric strengths of Hycar PA-11 and PA-31 compounds versus a vinyl insulation compound designed for high temperature service. The compounds were extruded on wire for testing. The PA compounds were cured in open steam after extrusion. Short lengths of the wire were aged in an air oven 1, 2 and 4 weeks and tested for dielectric strength.

It is interesting to note that the PA insulations gain in dielectric strength as they are aged whereas the vinyl loses. After two days aging, the PA's are as good dielectrically as the vinyl and after several days they are much better. A further advantage, not shown in the graph, is that the PA-11 and PA-31 stocks, after 4 weeks, had lost only 5 to 6 percent of their original weight and showed no indications of shrinkage or brittleness while the plasticized vinyl lost 42% of its weight, shrunk considerably and became very brittle.

White vulcanizates of polyacrylic rubber have unsurpassed resistance to discoloration in sunlight. A comparison with conventional rubber is exhibited in Figure 9 where portions of the test specimens were exposed 0, 8, 40 and 100 hours to ultraviolet light in an Atlas

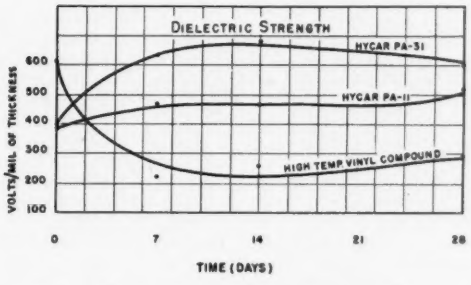


FIG. 8—Effect of air oven aging on dielectric strength of insulation compounds.

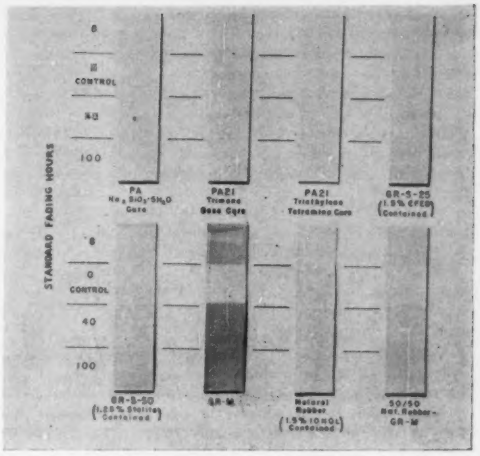


FIG. 9—Comparison of resistance of various rubbers to discoloration in ultraviolet light (Atlas Fade-Ometer Test).

Fade-Ometer. The GR-S, GR-M and natural rubber stocks are all based on a white sidewall recipe and show varying degrees of discoloring depending on the type of rubber and whether or not an antioxidant was contained. The three acrylic rubber samples are unaffected after 100 hours exposure. The slightly rough surfaces of the samples are due to an initial buffing operation to remove lubricants and soiled spots.

Some Potential Applications

Because of their unique and interesting properties, polyacrylic rubbers should be useful, possibly preferable to other elastomers, for the following products: O-rings, gaskets, grommets, hose, transmission and conveyor belts, actuating diaphragms, valve seats, packings, oil seals and other mechanical goods which come into contact with oils and/or high-operating temperatures; printing rolls, hot melt applicator rolls, mats, pads, air bags, protective coatings on heat resistant fabrics such as glass and asbestos; sunlight resistant, temporary coatings on rubber goods such as de-icers and tires; transformer leads, insulation on wire and bus bars, and white or pastel articles which require permanence of color.

It seems that all materials have limitations and polyacrylic rubbers are no exception. They too have limitations which must be considered. Most significant are slow acceleration, relatively high brittle point and affinity for water. Many improvements in the raw elastomers as well as methods of utilization have already been made and with the steadily growing interest in these materials, more can be expected as a backlog of information is accumulated.

Summary

To summarize, the Hycar polyacrylic rubbers are a family of thermoplastic, chemically saturated elastomers which cure in the presence of certain organic or inorganic bases and can be processed on standard rubber equipment.

Outstanding properties of their vulcanizates include

ability to withstand the deteriorating effects of sustained high temperatures in air and various non-aqueous immersion media; resistance to flexural breakdown, cut growth, ultra-violet light, oxidation, and the retention of good D.C. electrical properties after prolonged exposure to elevated temperatures.

They are recommended chiefly as specialty rubbers for the manufacture of rubber products to be used where the service conditions are too severe for conventional rubbers.

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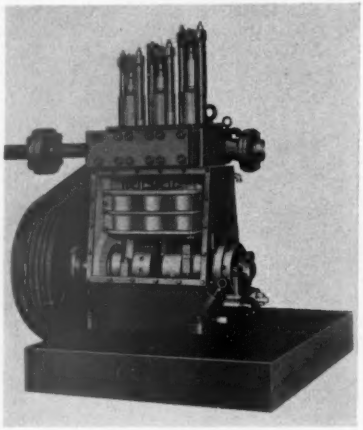
Aldrich Direct Flow Pumps

New features of design and construction are incorporated in a series of 5-inch stroke direct flow pumps manufactured by the Aldrich Pump Co., Allentown, Penna. The series includes a Triplex Pump with 3 cylinders, a Quintuplex with 5 cylinders, a Septuplex with 7 cylinders and a Nonuplex having 9 cylinders. The hp



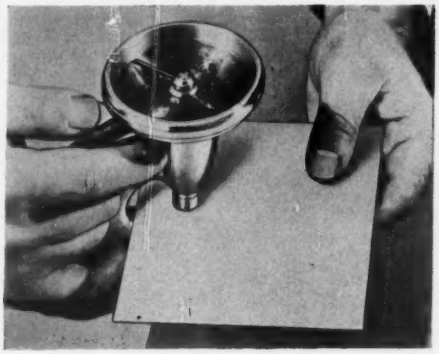
ratings of these pumps range from 100 hp with the Triplex to 275 hp with the Nonuplex. In this series all the wearing parts are interchangeable except the main bearings.

The construction of the fluid-end has the stuffing boxes located at the top of the pump. The fluid-end is sectionalized and is composed of separate units which include the working barrel, stuffing boxes, suction manifold and valve units. The suction and discharge manifolds are separate units which are bolted to a forged steel working barrel. The pump frame is a close-grained, semi-steel casting of rigid, box-like design.

The crankshaft is made of forged steel and has double roller main bearings on the Triplex pump and bronze-backed, babbitt-lined bearings on other types. All crank bearings are babbitt-lined. Wrist pins are bronze bushed and connecting rods are made of drop-forged steel.

Cady Hand Model Micrometer

Especially designed for easy portability and convenient for inspecting, checking, and comparing thicknesses, the Hand Model Micrometer manufactured by E. J. Cady & Co., 134 N. LaSalle St., Chicago 2, Ill., may be used in various locations throughout a plant, on the production line, or on the road. The dial is glass covered, 2¾ inches in diameter, graduated in thousandths of an inch. The



anvil is 9/16-inch diameter and permits calipering of thicknesses up to one-half inch of sheet stock or fabricated pieces such as rubber, plastics, metals, foil, etc. An external adjustment is incorporated for maintaining dial indicator at exact zero. The frame is cast aluminum, shaped to fit the hand comfortably. The anvil descends with even pressure, approximately 7 to 9 pounds per square inch (TAPPI standard).

Development of Machinery for Curing Tires

(Continued from Page 541)

The design of the bag indicated a cheaper bag to manufacture, but the life of the bag must necessarily be equivalent or better than the older type. At this point, the engineers had to depend on the chemist and compounder and they came through with flying colors. A compound composed mostly of synthetic rubber was used and some of the bags obtained have cured 500 tires before scrapping. This is way beyond the life of the normal curing bag. An average bag life of 300 cures should be easily attained.

Conclusions

In conclusion, it is believed that the Bag-O-Matic press described in this article will eventually replace all present methods of curing passenger size tires. The savings in manufacturing costs by this method are very apparent due to the fact that the number of manual operations required have been considerably reduced. The savings, however, go beyond this. Due to the shorter cures obtained, a great deal more production can be obtained from the same tire mold. These molds in themselves are very expensive pieces of equipment. The amount of conveyor equipment required has been considerably reduced due to the elimination of the intermediate operations. Pilot lines of these presses are now in operation in several plants and are producing amazing results in increased quality and decreased tire vulcanizing costs.

Editorials . . . . . .

Steelman Report

INITIAL analysis of the report of John R. Steelman on the maintenance of government control of the synthetic rubber industry and the disposal of production facilities indicates that the basic solutions to the problems are yet to be found. The Steelman report, which has been transmitted to Congress with President Truman's endorsement, was prepared after exhaustive meetings with government and industry groups. The report is expected to serve as the basis of new legislation to replace the Rubber Act of 1948 which expires on June 30, 1950.

It is evident from both the report and the letter of transmittal that the Administration is sincere in its desire to turn the synthetic rubber facilities over to private industry as soon as practicable. At the same time, however, the national security of the country must be maintained and the economy of the industry must be balanced. These are far from simple problems.

In a sense, the problems facing the government in divesting itself of the synthetic rubber industry may be compared to those facing the individual struggling in quicksand. Each time an effort is made to free the left foot, the right foot sinks that much deeper. The effort to free oneself is not discontinued, however, but generally some outside help is required. In the current instance, outside help must be supplied by the rubber industry and a proper cooperative effort will go a long way toward eliminating the government from the synthetic rubber field. The "spirit" is willing but the "flesh" must be strengthened.

Some of the complicated problems in the present picture were neatly paraphrased in a recent edition of the *Akron Beacon Journal,* including the following: The government wants to divest itself of the synthetic rubber plants *but* it wants to make sure that there will always be enough production facilities in event of another national emergency; it seems logical to give purchase priority to the companies which have been operating the copolymer plants *but* this might prove unfair to smaller firms that buy synthetic rubber for use in end-products; running a synthetic rubber plant requires financial stability and technical know-how *but* the government wants to avoid further concentration of business in the hands of dominant companies.

Also, the government frowns on close integration of raw material production and manufacturing processing *but* synthetic rubber manufacture is so closely tied with butadiene production on the one hand and rubber products manufacturing on the other that integration is almost inevitable; if the price of natural rubber goes down materially the ownership of a synthetic rubber plant could be a heavy liability *but* if that price goes up synthetic rubber making facilities could be a most valuable asset. These are but some of the problems and there are many others, including a "fair price" for the various plants concerned.

The rubber industry itself is divided on the question of future legislation. The one point on which the industry seems to be in total agreement is complete objection to any legislation of ten years duration. This was the recommendation made to Congress by the President "in order to provide adequate protection of the national security and to contribute to the development of a vigorous, competitive, and privately owned synthetic rubber industry in the United States." Some companies are pressing for immediate abandonment of government controls and others for extension of present controls for another one, two or three years. No great objections to mandatory consumption have been heard, but there is some feeling that it should be reduced to around a 100,000-ton figure.

As previously stated, in this and preceding editorials, the problems facing both government and industry are numerous. It is quite likely that a similar situation has never before faced this country. But an answer must be found, for under our system of free enterprise it is far more logical that the synthetic rubber facilities be owned and operated by private industry than that they be retained and operated for any length of time by the government.

CURRENT NEWS OF THE MONTH

PRESIDENT TRUMAN ASKS 10-YEAR CONTROLS IN MESSAGE ON SYNTHETIC RUBBER INDUSTRY

IN a special message to Congress on January 16, President Truman asked for the continuation of Federal interest in the $700,000,000 synthetic rubber industry for the next ten years. He also asked for authority to prescribe minimum consumption standards pending early disposal of the Government-owned plants to private owners. The first inkling of administration policy on the synthetic rubber question came in the President's budget message, delivered a few days earlier which assumed continued Government operation of synthetic rubber plants through 1950-51. In his message to Congress, President Truman called for the maintenance of existing plant capacity of 1,000,000 tons a year either in operation or in standby condition. His message accompanied an exhaustive report on the synthetic rubber situation by John R. Steelman, acting chairman of the National Security Resources Board.

At the outset of his report, Mr. Steelman conceded that "Government ownership conflicts with the general policy that domestic industry be free, competitive, and in private hands." Mr. Truman accepted this observation, and in his message to Congress proposed:

"The President should be authorized to dispose of the synthetic rubber facilities to private owners, under conditions which will protect the national security and promote effective competition.

Stockpiling Not Enough

"It is essential to our national security that facilities to produce enough high-quality synthetic rubber to meet our needs in an emergency be continuously available. We must build up a stockpile of natural rubber, and we have been doing so, but the accumulation of a stockpile large enough to meet all emergency needs for rubber is impractical. We must be equipped to meet the bulk of our needs from domestically produced rubber."

Looking to early sale of at least part of the Government's synthetic rubber facilities to private owners, Mr. Truman suggested a series of legislative safeguards against abusive monopoly in the field.

The Government's synthetic rubber program now relies for its authority on legislation passed in 1948 and terminating next June 30. That law forbade the sale of any government-owned synthetic facilities built during World War II but called for executive recommendations by this month looking to disposition.

The report, prepared under the direction of Mr. Steelman by an interdepartmental committee, made these recommendations covering both active and stand-by plants:

"It is recommended that the President be given authority to designate the specific synthetic rubber facilities which, in his judgment, are necessary to provide the synthetic rubber capacity needed for national security and the common defense.

"A continuation of the present policy of top maintenance with respect to stand-by rubber plants is essential in the interest of national defense. It is, therefore, recommended that the President also be authorized to maintain in adequate stand-by such nonoperative facilities in whole or in part, as he may designate."

Six Recommendations Made

With respect to active plant capacity, the report recommended that the President be authorized as follows:

1. To establish the minimum level of production and consumption of general-purpose synthetic rubber which in his judgment is necessary in the interest of national security and the common defense.

2. To establish a minimum level of production and consumption of butyl rubber, until one of the butyl rubber plants has been sold to private industry.

3. To exercise controls specifying the minimum proportions of general-purpose synthetic rubber which must be incorporated in such rubber products as he may designate, to the extent necessary to assure that total consumption of general-purpose synthetic rubber, including voluntary consumption, shall be not less than the minimum which he has established.

4. To exercise similar specification controls with respect to butyl rubber until disposal of the first butyl rubber producing facility.

5. To impose such import restrictions on finished and semi-finished rubber products as he deems necessary to assure equality with like or similar products produced within the United States in accordance with specification controls applicable to domestic manufacture.

6. To produce and sell synthetic rubber and its components to the extent necessary to meet the minimum security level of production and consumption and, to the extent practicable, additional quantities to meet demand above this level (provided, however, that there shall be no obligation to produce these additional quantities), to provide technical service to consumers of synthetic rubber, and to do all things necessary in connection with and related to such production and sale. (EDITOR'S NOTE: The President's message is printed in full elsewhere in this issue).

Industry Weighs Proposals

Industry circles are weighing the President's message carefully in order to present at Congressional hearings scheduled for next month their proposals for the synthetic rubber program. It is pointed out in these circles that Congress, in the Rubber Act of 1948, stated that it is "the policy of the Congress that the security interests of the United States can and will best be served by the development within the United States of a free, competitive synthetic rubber industry."

Assuming that Congress' attitude in this respect remains unchanged, it is felt in the industry that assurance can be provided for adequate GR-S production, desired by President Truman, without putting the industry in a Government "strait-jacket" for an indefinite period ahead.

Certain industry circles, also, are critical of the President's evident aversion to "bigness," as such, in rubber production, as implied in his insistence that, in disposal of Government facilities, they must be distributed widely, and anything like a complete or near-complete integrated setup must be avoided.

Any disposal policy which would tend to hamper development of efficient, low-cost production, it is held in these quarters, might result in defeating the purpose, professedly sought by the President, of achievement of synthetic rubber production truly competitive with natural rubber.

For the moment, final decisions on all parts of proposed recommendations by the rubber companies have not yet been reached, and it may be some time before generally acceptable proposals are worked out. Also, it is seen as possible that, among individual companies, diverse opinions may develop—such as on recommendations on Government disposal policies. Fairly general agreement is likely, however, on certain major proposals.

Senate Plans Hearings

Senate consideration of the Administration's ten-year synthetic rubber program will be handled by two committees under a unique arrangement worked out by Chair-

man Millard Tydings (Dem., Md.) of the Armed Services, and Chairman Burnet Maybank (Dem., S. C.) of the Banking and Currency Committees.

With some details yet to be worked out, the two have agreed to this arrangement:

Armed Services, to which the President's rubber program was officially referred, will conduct hearings on those recommendations directly concerned with national security and stockpiling.

The Banking Committee will consider aspects directly involving the Reconstruction Finance Corp., such as disposal of the Government's rubber manufacturing facilities, now operated by RFC, to private industry.

Under the President's proposed program RFC would continue to manufacture and sell synthetic rubber until private industry starts producing substantial quantities.

The agreement came about after Senator Maybank wrote to Senator Tydings calling his attention to the split jurisdiction, which he said is dictated by the Congressional Reorganization Act. Matters affecting RFC go to the banking group and those affecting national security, to Armed Services, he noted.

The Armed Services group's rubber "expert" is control-minded Senator Lyndon Johnson (Dem., Tex.). The member taking the keenest interest in rubber on the banking committee is Senator John Bricker (Rep., Ohio), author of the present law. His views have been markedly anti-control. Neither would comment on the recent agreement.

Despite this agreement, however, it is not yet clear whether the Armed Services Committee will leave consideration of RFC problems solely up to the banking group. It is possible that Senator Tydings may decide on a broad-scale inquiry covering such matters nominally under jurisdiction of the banking committee, relying on the latter for advice and seeking its agreement on major policy decisions.

Armed Services may defer its consideration, however, until the 7-man House and Services subcommittee, headed by Representative Carl Vinson (Dem., Ga.), is well under way with its own hearings. The Vinson group was expected to open hearings the first week of February.

In the last Congress, the Senate Banking Committee had exclusive jurisdiction in framing the present Rubber Act. Senator Maybank said this was because the rubber program was primarily an RFC operation.

Representative Shafer's Comments

In his comments on the President's proposals, Representative Paul W. Shafer (Rep., Mich.) said the request for a ten-year synthetic rubber program "asks for too much for too long" and said he will press for enactment of a three-year extension of the present law at this session, with some cutbacks in Government rubber production.

Rep. Shafer said he will propose that the President be stripped of his authority, exercised the past eight years, to require private industry to use synthetic rubber, unless industry's voluntary use of tire rubber falls below 150,000 long tons a year.

Rep. Shafer, co-author of the Rubber Act of 1948, declared himself in favor of giving a one-year "fair trial" to the Administration's program for selling the Government's synthetic rubber plants to private industry.

He criticized the President's recommendations, submitted to Congress, as "not positive." He said the accompanying report, drafted by Presidential Aide John R. Steelman, "vaguely expressed faith in free enterprise but tries to perpetuate for ten years the unerring judgment of Government administrators.

"While the President asks that the authority be granted to him, it actually means that such authority will be delegated to the Rubber Section, Office of Domestic Commerce of the Department of Commerce, headed by Earl Glenn, to which the President previously delegated authority granted by Congress.

"Glenn has practically dictated Government rubber policy," Shafer charged, "with the complete and sometimes unidentified support of the Munitions Board." Mr. Shafer said "no one knows" what the board's policy is. The board is charged with responsibility for stockpiling natural rubber.

Rep. Shafer said he will ask a special House Armed Services subcommittee, headed by Representative Vinson, to enact a synthetic rubber bill with these main provisions:

a. Extension until June 30, 1953, of "standby" authority to the President to require private industry, by Government regulation, to use GR-S. This authority could be used only if industry's consumption rate drops below 150,000 tons a year.

b. Three-year authority to the Government to produce no more than 150,000 tons of GR-S. Mr. Shafer said this is "adequate to satisfy national security requirements and assure the technological progress of synthetic rubber."

c. Authority for one year to the Government to produce an additional 50,000 tons of GR-S to "prevent a serious dislocation in business." This authority would run concurrently with disposal of Government plants which are now producing GR-S.

d. Authority to "immediately offer Government rubber plants for sale." The President would be required to report to Congress on the progress of disposal by June 30, 1951.

e. Removal of all production and consumption controls on butyl rubber. The President asked continuation of these controls until at least one of the two butyl plants is sold.

f. Three year authority to keep synthetic rubber plants, not sold for private production, in emergency standby condition.

Rep. Shafer, a member of the Vinson subcommittee which will conduct hearings on the President's recommendations, said, "The President's disposal plan should be afforded a fair trial in view of the inaction of the Government on plant disposal."

Adoption of recommendations authorizing these controls for ten years, Mr. Shafer said, "would mean abdication by Congress of its prerogatives for ten years, during which Government policy would be formulated with no consideration to the intentions of Congress."

Rep. Shafer said Congressional hearings on the President's proposals "should not take too long since everybody has a clearer picture of the situation now" than two years ago.

Rubber Tree Planting

A series of experiments in India sponsored by the India Rubber Board is currently being made to prove the proper density of rubber tree planting. The general rule in the past has been 150 trees to the acre, with subsequent thinning as the trees begin producing. The India rubber experimenters appear to favor density of original planting up to 180 trees to the acre. Because domestic consumption is greater than production, expansion of producing areas in India is being urged.

M.I.T. Colloid Chemistry Course

A three-weeks special course in the colloid chemistry of elastomers, from June 26 to July 14, will be a feature of the 1950 summer session at the Massachusetts Institute of Technology, Cambridge, Mass. Designed primarily for engineers and scientists from the rubber and plastic industries, the course will be given by Dr. Ernst A. Hauser, professor of colloid chemistry in the Institute's Department of Chemical Engineering. The course will be held on week-day mornings at a cost of $90. For laboratory demonstrations of manufacturing and processing methods, the equipment of the M. I. T. rubber laboratory will be available.

Revise Scrap Specifications

The Rubber Reclaimers Association, Inc., has revised its specifications for scrap rubber as of January 17, 1950. Minor changes have been made in the sections covering bales (packing), separation of grades, failure to deliver, and rejections. The major change made in the rejection specification is to the effect that where rejections are concerned all handling costs incurred in connection with the disposal of the material shall be charged to the seller. Copies of the specifications may be secured by writing to the Rubber Reclaimers Association, Inc., 250 West 57th St., New York 19, N. Y.

Asks Appropriation for Guayule

President Truman's budget for the fiscal year of 1950 asks an appropriation of $209,000 in order to keep Government research on guayule going for another year. What is left of the once extensive work done on guayule is being carried on by the Agricultural Department in laboratories at Salinas, Cal., where a stand of the shrubs has been cultivated for testing purposes. The budget describes the guayule research program as one of several investigations the department is making "into strategic and critical agricultural materials."

SYNTHETIC PLANTS DISPOSAL INVOLVES SALE OF 28 UNITS

A survey of the synthetic rubber facilities in operation in the United States has indicated that there are 28 plants representing a total investment of $472,682,000 involved in the current disposal controversies. President Truman, in his recent message to Congress, asked that 26 of these plants be sold to private industry as soon as it can be done. Of the two remaining plants, one is operated for the Government by the University of Akron as a research center. The other has been requested by the Air Force as a testing site for Ram-Jet engines.

All 28 plants accounted for $1,653,110 in net earnings during the fiscal year 1948-49, according to the Office of Rubber Reserve. Gross income for the period amounted to $173,919,049, of which $173,376,888 came from the sale of all types of synthetic rubbers to industry and the rest from miscellaneous sources. The largest single expense of the plants was in the cost of what it takes to produce synthetics, $129,811,255. Another $28,906,028 went into depreciation on the 17 plants in operation and on the equipment in each.

The synthetic program also took $3,628,577 in research, $3,549,756 on unrecovered sales, freight, storage and handling, $1,591,003 for administration, $3,878,296 in interest and $901,024 in miscellaneous expenses of the over-all operation. In addition, the Government spent $2,355,116 in maintaining the 11 other plants it has in a "stand-by" condition for possible emergency use.

Net income for the 1947-48 fiscal period amounted to $7,161,292 after meeting all expenses including $31,703,155 for depreciation. Stand-by maintenance during that period cost the Government $5,625,276.

Additional Plant Data

If the President's recommendations are followed, 8 operating and 5 stand-by copolymer plants will be up for immediate sale. These plants are equipped to produce general-purpose synthetic rubber. The Government is also faced with the disposition of 2 butyl rubber plants, 4 operating and 5 stand-by operations for making butadiene, 1 styrene producer, and a small New England facility classed as miscellaneous. Presently the plants have a design capacity for turning out 600,000 long tons a year, of which 183,000 is cold rubber.

Under the stress of war, the Government built 51 synthetic plants. Their production capacity at the cessation of hostilities was just over 1,000,000 long tons a year. Since August, 1946, the Government has sold 18 of them to various rubber and chemical companies for a total of $57,320,000. Plant investments at the time each sale was made totaled $165,243,000.

Seven of these plants, including a GR-S plant at Louisville, Ky., for which the B. F. Goodrich Co. paid $4,187,000, went to industry with RFC restrictions as to their products and use. The remaining 11 plants were closed out with no such restrictions. The Government still has 5 plants which have been declared surplus in the synthetic program but which have not been sold.

Coming Events

Feb. 27-Mar. 3. A.S.T.M. Committee Week and Spring Meeting, Hotel William Penn, Pittsburgh.
Mar. 2. Southern Ohio Rubber Group, Engineers Club, Dayton.
Mar. 7. Los Angeles Rubber Group, Mayfair Hotel, Los Angeles.
Mar. 13-15. N.A.W.M.D. Annual Convention, Waldorf-Astoria Hotel, New York.
Mar. 17. Boston Rubber Group, Somerset Hotel, Boston.
Mar. 23. Quebec Rubber & Plastics Group, Canadian Legion Hall, Montreal.
Mar. 24. Chicago Rubber Group, Morrison Hotel, Chicago.
Mar. 28-31. Fourth National Plastics Exposition (SPI), Navy Pier, Chicago.
Mar. 31. Akron Rubber Group, Mayflower Hotel, Akron.
Apr. 4. Buffalo Rubber Group, Westbrook Hotel, Buffalo.
Apr. 12-14. A.S.M.E., Spring Meeting, Washington, D. C.
Apr. 19-21. Rubber Division, A.C.S., Spring Meeting, Book-Cadillac Hotel, Detroit.
Apr. 20. Quebec Rubber & Plastics Group, Canadian Legion Hall, Montreal.
May 12. Chicago Rubber Group, Morrison Hotel, Chicago.
May 19. Buffalo and Ontario Rubber Groups, Joint International Meeting, General Brock Hotel, Niagara Falls, Ontario.
June 3. Southern Ohio Rubber Group, Annual Outing.
June 16. Akron Rubber Group, Annual Outing.
June 16. Boston Rubber Group, Annual Outing.
June 16. Quebec Rubber & Plastics Group, Annual Golf Tournament.
June 19-22. A.S.M.E., Semi-Annual Meeting, St. Louis, Mo.
June 23. Detroit Rubber & Plastics Group, Annual Outing, Forest Lake, Mich.
June 26-30. A.S.T.M., Annual Meeting, Chalfonte-Haddon Hall, Atlantic City.
July 14. Buffalo Rubber Group, Annual Outing.
Sept. 14. Southern Ohio Rubber Group, Engineers Club, Dayton.
Sept. 19-21. A.S.M.E., Fall Meeting, Worcester, Mas.
Oct. 6. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit.
Oct. 11-13. Rubber Division, A.C.S., International Rubber Meeting, Hotel Cleveland, Cleveland.
Oct. 20. Boston Rubber Group, Somerset Hotel, Boston.
Nov. 26-Dec. 1. A.S.M.E., Annual Meeting, New York, N. Y.
Dec. 8. Detroit Rubber & Plastics Group, Xmas Party, Detroit-Leland Hotel, Detroit.
Dec. 15. Boston Rubber Group, Xmas Party, Somerset Hotel, Boston.
Dec. 16. Southern Ohio Rubber Group, Xmas Party.

COLLYER SEES TRADE RESTRICTION IN APPROVAL OF HAVANA CHARTER

Provisions of the International Trade Organization's Havana Charter relating to inter-governmental commodity agreements would encourage the formation of cartels, restrict rather than expand trade, and lessen competitive enterprise, John L. Collyer, president of the B. F. Goodrich Co., said recently.

"The rubber industry has had more opportunity than any other American industry," Mr. Collyer said, "to observe firsthand the stultifying effects of commodity agreements formed by groups of foreign governments in the crude rubber field. Under these cartels, production was restricted, prices raised, and normal expansion of rubber consumption retarded. For the United States to ratify the International Trade Organization charter would countenance formation of similar commodity agreements and would not be in the best interests of our competitive economy or of the American people."

Mr. Collyer did not criticize the stated objectives of the Havana Charter, which he said include increased production, consumption, and exchange of goods to contribute to a balanced and expanding world economy, the reduction of tariffs and other trade barriers on a mutually advantageous reciprocal basis, and the elimination of discretionary treatment in international commerce.

"However," he said, "the reciprocal trade agreements in effect today were designed to accomplish the objectives of the Havana Charter and are currently a part of our foreign policy. Since these agreements have failed to prevent independent contrary action by other signatory countries, we see no reason to believe that a new charter will be any more effective than present agreements.

"It is strongly recommended that every effort be made to insure that existing agreements be observed by all participating nations before undertaking to design even more comprehensive international agreements," Mr. Collyer said.

PMMA Officers for 1950 Season

D. S. Frederic, vice-president of the Rohm & Haas Co., was re-elected president of the Plastic Materials Manufacturers Association, Inc., at that group's annual meeting held on January 19 in New York City. F. N. Williams, vice-president of the Monsanto Chemical Co., was re-elected vice-president of the association. F. H. Carman was elected secretary-general manager and J. E. Walker treasurer for the coming year.

Kohnstamm Celebrates Centennial

H. Kohnstamm & Co., Inc., New York, N. Y., celebrated its 100th anniversary recently. The firm was founded by Joseph Kohnstamm for the manufacture of Ultramarine blue, widely used in the laundry business. Subsequently, new items were added to the company's line. Today, the firm manufactures coloring agents for the rubber and other industries.

LITCHFIELD FORESEES INCREASED USE OF RUBBER IN ROAD PAVING

Thousands of miles of American highways, as well as school playgrounds, tennis courts and other recreation spots, will be surfaced with rubber in the next decade, according to P. W. Litchfield, chairman of the board of the Goodyear Tire & Rubber Company. Mr. Litchfield made this forecast recently following an inspection of a section of rubber highway installed at his direction 25 years ago, and several stretches of rubber-surfaced thoroughfares and school recreation yards put down in the Akron area by his company since the war.

The 25-year road, consisting of natural rubber blocks, has withstood the pounding of millions of cars and heavy trucks, and shows little or no deterioration. It was laid on heavy-traveled East Market St., Akron, directly in front of Goodyear's home offices and Plant I. However, it became immediately apparent that solid rubber blocks were too expensive to be used generally in paving and the idea did not progress.

The post-war surfacing jobs, using both natural and synthetic rubbers in various forms in mixture with asphalt, are being watched closely by paving construction men, and to date have brought forth commendable performance reports.

Performance Effectiveness

Natural and synthetic rubbers in combination with asphalt mixes, Mr. Litchfield said, have proved to be about equally effective in initial performances and to some extent, reclaimed rubber lends itself to the same uses. He added that rubber-asphalt surfaces show less tendency to "bleed" and thus become slippery, particularly in hot and wet weather, and show a decided decrease in brittleness in cold weather. Used as a playground surfacing material, rubber, he indicated, seems to be the partial answer to the age-old problem of skinned arms, knees and faces and sometimes more serious injuries incurred when children romp.

The Goodyear executive continued that on the basis of performances shown by several roads laid in Holland before the war and which he inspected on a recent trip to Europe:

1. Road surfaces would last longer. Roads placed 12 to 15 years ago, and which were subjected to terrific pounding by heavy Nazi war vehicles, are in excellent condition even today.

2. The rubber-asphalt mixture serves as a sealer, thus protecting the road foundation from seepage of surface water and resultant damages, especially during severe cold weather and rapid thaws.

3. Maintenance costs were reduced considerably as a result. In Holland little or no maintenance was necessary on the rubber-surfaced roadways, while stretches of the same roads not surfaced with the rubber-asphalt were repaired as often as three times in 10 years.

4. Traffic tie-ups on roads under repair would be minimized, since vehicles can move over rubber-asphalt within a few hours after the material is applied. Only where foundation damage is severe would any sub-surface repairs be necessary because of the stability of the rubber-asphalt mix when used as a filler-sealer surface.

Great strides have been made by the rubber industry in providing the supreme in tire-cushioning for cars and trucks, Mr. Litchfield said. But the continuous impact of rolling wheels on roads causes damage of varying degrees to the highways as well as the vehicles themselves. With a cushion of rubber on which tires could roll, maintenance on vehicles likewise would be reduced, he said.

Future Estimates

Mr. Litchfield estimated that during the next 10 years a yearly average of 650,000 miles of highways would be newly constructed or resurfaced, and that by the use of rubber-asphalt surfacing material millions of dollars would be saved in highway and vehicle maintenance costs.

A five per cent mixture of rubber with the conventional asphalt mix, applied at an average thickness of an inch and a half on a 24-foot highway, would add about $1,000 per mile to the installation costs, he said.

Mr. Litchfield pointed out too, that the successful use of synthetic rubber, as well as natural rubber, could well serve as a cost-bearing means of keeping the war-emergency plants in continued operation. One advantage is that synthetic rubber can be "tailor-made" to meet specific construction requirements.

"With such expanding markets for rubber as this development suggests," he said, "there is the prospect that we can keep our own vital synthetic plants in active operation and at the same time absorb the increasing output of the natural rubber plantations which are now experiencing a rapid rate of post-war rehabilitation."

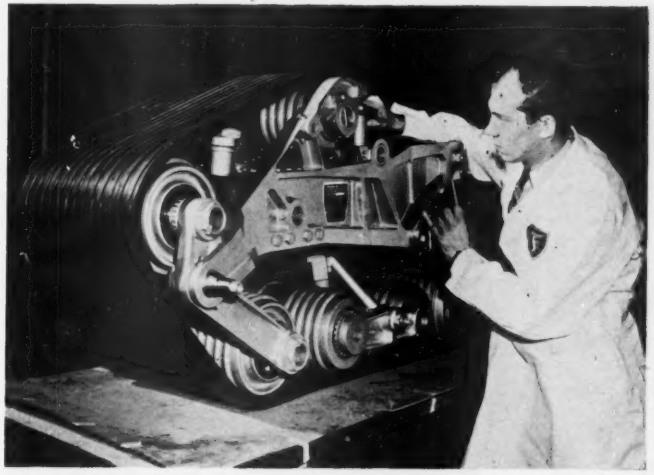
Frank Seiberling Retires

Frank A. Seiberling, founder and chairman of the board of the Seiberling Rubber Co., Akron, Ohio, resigned his position with the company on January 1. Mr. Seiberling, who is 90 years old, was also the founder of the Goodyear Tire & Rubber Co. He has been in ill health for the past year. The company made no immediate announcement of Mr. Seiberling's successor as board chairman. The board will consider the vacancy at its next meeting.

R. D. Wood Appoints Prentice Co.

E. V. Prentice Co., 2303 N. Randolph Avenue, Portland 12, Ore., has been appointed exclusive Pacific Northwest sales representative of the R. D. Wood Co., Philadelphia 5, Penna., manufacturers of hydraulic presses for the rubber, plastics, plywood and other industries. The Prentice company will offer complete sales and service facilities for R. D. Wood in the Northwest area.

FIRESTONE DESIGNS IMPROVED "FLYING RUNWAY" FOR B-50 BOMBERS



Pictured above is the Flying Runway nose track gear of a B-50 bomber, largest plane yet to use the Firestone track-type landing gear successfully. Of the same basic design as the first Flying Runway developed for the Air Force by Firestone engineers in 1943 for use on unimproved airports, soft ground and sand, this gear has made test landings at 160 miles per hour under a 30,000 pound load. It has been proved practical in tests simulating tropic and arctic weather conditions. The rubber track is built around steel reinforcing cables. Its inside ribs fit into the matched grooves of the forged aluminum bogie rollers to keep the belt in position when the aircraft makes taxi turns. Air hydraulic springs, or oleos, maintain constant tension on the belt and provide a shock absorbing cushion that minimizes landing impact. W. A. Bishop, Firestone engineer, is adjusting the top bogie roller, which turns at a speed of 7,000 rpm during fast airplane landings.

PRESIDENT TRUMAN'S MESSAGE TO CONGRESS ON SYNTHETIC RUBBER

Because of its interest to the rubber manufacturing industry, the recommendations on the synthetic rubber program made by President Truman to the Congress of the United States on January 14, 1950, are reproduced in full below:

To the Congress of the United States:

The tremendous increase in the use of rubber is one of the outstanding features of our industrial development in the last 50 years. Rubber has become indispensable to the United States, in both peace and war. Yet, 10 years ago this country was dependent for practically all of its supply of this essential material on areas halfway around the world. Early in World War II these areas were lost, and it became necessary to develop a domestic source of rubber. The creation, in the midst of war, of a new industry capable of supplying a million tons of synthetic rubber a year was one of the great achievements of our war effort.

Since the war, the sources of natural rubber have again become available to us, and production has increased as the destruction and dislocations of war have been overcome. At the same time, the world demand for rubber has risen so far above the prewar levels that the supply of natural rubber is still less than demand. Thus, continued production of synthetic rubber in this country has prevented a serious world rubber shortage.

Facilities for producing general-purpose synthetic rubber, commonly called GR-S, are owned by the Government, as are the plants for producing butyl, the type of synthetic rubber used primarily in inner tubes. Facilities for producing other types of synthetic rubber are now all privately owned. In 1949 about 289,000 long tons of GR-S and 52,000 long tons of butyl were produced by the Government. In addition, about 53,000 long tons of other synthetic rubbers were produced in privately owned plants.

It is essential to our national security that facilities to produce enough high-quality synthetic rubber to meet our needs in an emergency be continuously available. We must build up a stockpile of natural rubber, and we have been doing so, but the accumulation of a stockpile large enough to meet all emergency needs for rubber is impractical. We must be equipped to meet the bulk of our needs from domestically produced rubber.

The Government's synthetic rubber activities are now conducted under the Rubber Act of 1948, which expires on June 30, 1950. This legislation provides that capacity for production of synthetic rubber shall be maintained in the United States at all times, and requires that minimum quantities shall be produced and consumed each year. It provides authority for continued Government production of synthetic rubber, for regulations requiring its consumption in certain products, for stand-by maintenance of plants not in operation, and for continued Government research in synthetic rubber. Although the act prohibits the disposal of the facilities in the synthetic rubber program, it declares it to be the policy of the Congress that Government ownership shall terminate whenever consistent with national security. The act provides that on or before January 15, 1950, the President shall recommend to the Congress "legislation with respect to disposal of Government-owned rubber-producing facilities * * * together with such other recommendations as he deems desirable and appropriate."

As a basis for making recommendations to the Congress, I have had made a thorough investigation of all aspects of the rubber problem. A report summarizing the results of this investigation is transmitted to the Congress with this message. The detailed recommendations in that report have my approval.

The rubber policy of the United States should be based upon the fundamental national objectives of protection of the national security, promotion of a free competitive economy, and achievement of a peaceful and prosperous world. I recommend that legislation succeeding the Rubber Act of 1948 be enacted, setting forth this rubber policy, and providing for continuation of the synthetic rubber industry in a manner consistent with these objectives.

In order to maintain the productive capacity needed in the event of emergency, the President should have the authority to designate the plants which must be kept available at all times for synthetic rubber production. On the basis of present technology and estimated requirements, it appears that our present plant capacity of nearly a million tons a year should be maintained to be prepared to meet emergency needs for synthtic rubber. It is not necessary, however, that all this capacity be in operation. Maintenance in a stand-by condition of those plants which are not being used should, therefore, be authorized.

In order to encourage technological development in the production and use of synthetic rubber and to provide a basis for rapid expansion of production if this proves necessary, at least a minimum quantity of each type of synthetic rubber must be produced and consumed. Certain types of synthetic rubber, which are privately manufactured, have established a sufficiently strong position in the competitive market to assure a continuing demand for them. Recent improvements in butyl rubber, which is produced only in Government-owned plants, make it superior to natural rubber for use in inner tubes, its major use. It is probable, therefore, that as soon as private production of butyl begins, this type of synthetic rubber will be produced and consumed in adequate volume in a competitive market. Until butyl is privately produced, however, the President should have the authority to determine the minimum quantities of butyl which must be produced and consumed, and to the extent necessary to require its use in specified products.

The situation with respect to general-purpose synthetic rubber (GR-S) is not quite so favorable. Since it is not yet a satisfactory substitute for natural rubber in all of the products for which it would be used in an emergency, it is desirable that the Government's authority to conduct research in this field continue. The physical properties of GR-S have been steadily improved in recent years, and at present the quality differences between GR-S and natural rubber for peace-time general-purpose uses (chiefly passenger-car tires) are not significant. Price differentials are likely to be the determining factor in the choice between the two rubbers for most uses. It is very possible that for some time to come a considerable volume of GR-S production will be required, since the supply of natural rubber is not likely to be sufficient to meet world market demand. This possibility, however, is not an adequately dependable base for national security planning.

I believe that, at the present time, at least one-quarter of total consumption of GR-S and natural rubber, and not less than 200,000 long tons annually, should be GR-S. However, the needed level of production and consumption may change over the next few years with changes in world conditions. Therefore, the President should be given the authority to establish from time to time the minimum level of production and consumption necessary to the national security.

The present technological position of general-purpose synthetic rubber is such that it probably could not compete for bulk uses with natural rubber offered at significantly lower prices. There is thus no adequate assurance that the demand for GR-S either because of the possible shortage of natural rubber or because of its technological qualities, will be sufficient to insure production and consumption at levels necessary for national security. The President should, therefore, have authority to require the use of GR-S in certain products to the extent necessary to assure such production and consumption.

The minimum level of production and consumption should not be higher than the national security requires, for if it were, it would unduly prevent consumers in this country from realizing the benefits of market competition, and interfere with our objectives of expanding world trade and world prosperity.

It is my earnest hope that controls on consumption of GR-S may be reduced or suspended over the next few years, as technological improvements result in increasing quantities of general-purpose synthetic rubber being consumed without Government support. This development should be stimulated by the disposal of the Government's plants to private owners.

The President should be authorized to dispose of the synthetic rubber facilities to private owners, under conditions which will protect the national security and promote effective competition.

The disposal of these plants while promoting effective competition will present many difficult problems. The plants are large and involve large-scale operations. Furthermore, only a few plants are required to meet the probable demand for both required and anticipated voluntary consumption of synthetic rubber. The

legislation authorizing disposal should take account of these facts, and provide specific standards designed to assure that the disposal program will actively promote effective competition and avoid monopolistic concentration.

A special problem will arise when general-purpose synthetic rubber plants are privately owned, if the Government continues to require the use of synthetic rubber in certain products. In this situation, the Government must see that synthetic rubber is made available on fair and reasonable terms and conditions to those required to use it. Such Government intervention in the normal buyer-seller relationship will present difficult practical problems for both industry and Government. Development of a vigorous private synthetic rubber industry, however, may soon result in adequate consumption of synthetic rubber to permit removal of Government regulation.

I believe that the policies outlined in this message and the detailed recommendations contained in the accompanying report provide a sound program for action. For this reason, the legislation establishing these policies can be of relatively long duration. Furthermore, a firmly established legislative framework is highly desirable if disposal of the Government's synthetic rubber plants is to be successful. I recommend the adoption of legislation of ten years duration in order to provide adequate protection of the national security and to contribute to the development of a vigorous, competitive, and privately owned synthetic rubber industry in the United States.

HARRY S. TRUMAN

THE WHITE HOUSE,
January 14, 1950

Niles-Bement Pond Changes

Niles-Bement-Pond Co., West Hartford, Conn., has announced the promotion, retirement and reassignment of some of its personnel in a move to achieve better coordination between divisions of the company and for reasons of economy. Niles-Bement-Pond Co. consists of the Pratt & Whitney Division, its subsidiary, Potter & Johnson Co. of Pawtucket, R. I., and the Chandler-Evans Division. William P. Kirk, vice-president and sales manager of machine tools, has retired from active participation in the sales program of the company. He will, however, continue to serve the company in the capacity of consulting engineer and will also represent Pratt & Whitney in certain association work. Alexander H. d'Arcambal, who has been associated with the company for 30 years, will have full responsibility for and authority over all activities of all sales departments of the company. The following will report to Mr. d'Arcambal: J. D. Allan, manager of domestic machinery sales for Pratt & Whitney; J. C. Molinar, manager of domestic small tools and gage sales for Pratt & Whitney; H. Reichert, manager of foreign sales for Pratt & Whitney; R. M. Johnson, sales manager of Chandler-Evans; J. Potter Cunningham, vice-president and sales manager of Potter & Johnson Co.; and V. L. Howe, acting advertising manager.

Remensnyder Named Heyden Head

John Paul Remensnyder

The board of directors of the Heyden Chemical Corp., New York, N. Y., has elected John Paul Remensnyder president of the company to succeed the late Bernard R. Armour. Mr. Remensnyder has been associated with the company since 1920. He was elected a director and vice-president of the company in 1944, and has been in charge of the company's sales. He is a member of the Synthetic Organic Chemical Manufacturers Association, the treasurer and a governor of the Drug and Chemical Club. Mr Remensnyder is a past director of the New York Board of Trade. The board of directors of the company also decided to continue the Management Committee which was appointed in December, 1949, after the death of Mr. Armour. The members of this committee, in addition to Mr. Remensnyder, are R. Lulek and S. Askin, both vice-presidents and directors of the company, and Mr. P. van der Stricht, the secretary and a director of the firm.

Chart on Transparent Films

A newly-compiled chart, which presents in easy reference form the comparative characteristics of commonly-used transparent films, is being offered to users of films by the National Adhesives Division of National Starch Products, Inc., 270 Madison Avenue, New York 16, N. Y. Films in general use today have been set up in the chart in 14 groups, according to the basic chemical composition. In addition to their identification by their physical or chemical reactions, and their manufacturers, the films are further described as to their respective trade names, their gauge or thickness, commercial types according to the manufacturer's code description as well as their characteristics in actual use. Supplementing the chart is a pocket-size booklet "How to Handle Adhesives for Transparent Films," in which further details of general types of adhesive formulations for bonding transparent films, proper handling methods, and some of the problems encountered in obtaining good adhesion are discussed.

BRITISH RUBBER PRODUCERS LAUNCH $10,800,000 PROGRAM

British rubber producers have launched a $10,800,000 five-year program to improve and popularize natural rubber. The plan was announced by the British Rubber Development Board which said the industry has recognized "it must reckon with sustained competition." The statement said the producers are not "attacking synthetics," nor do they seek to raise the price of their own product.

Financed by Malayan rubber producers, the program will be divided into two parts. The first part consists of a five-year plan of research and development costing $8,400,000 to make natural rubber better. The second part of the plan consists of a drive to boost the demand for natural rubber both in the United States and Britain.

A spokesman for the board said about $2,400,000 will be spent in the U. S. and Britain this year on market research and publicity.

Promotions at Bearfoot Sole

The board of directors of the Bearfoot Sole Co., Wadsworth, Ohio, have announced the election of four new vice-presidents of the organization. Edwin E. Calvin, son of Edwin Calvin, president and founder of the company, has been elected vice-president in charge of personnel. T. D. Calvin, son of I. B. Calvin, the company's treasurer, has been elected to the post of vice-president and assistant treasurer. He will continue with his other duties as director of purchases and industrial engineer. Edward Gulbis, former research director of the company, has been elected vice-president in charge of research and development. Benjamin D. White, associated with the company since 1928, has been elected vice-president in charge of engineering.

AICE Akron Section Officers

Leonard M. Freeman, manager of works laboratories for the B. F. Goodrich Co., has been elected chairman of the Akron Section of the American Institute of Chemical Engineers for 1950. Robert C. Stell, in charge of the Chemigum Plant of the Goodyear Tire & Rubber Co., has been elected vice-chairman. John W. Koslo, also associated with Goodyear's Chemigum operation, has been elected secretary. William Harlacher, associated with Goodrich, is the newly-elected treasurer of the section.

Elected Assistant Treasurer

Thermoid Co., Trenton, N. J., has announced the election of Donald A. Fruland to the position of assistant secretary. The election closely followed his appointment as director of purchases of the company. Mr. Fruland first joined the purchasing staff of the company in 1947, having previously been associated with the Gulf Oil Corp. as marine purchasing agent in New York City. Emil J. Houser has been appointed assistant purchasing agent.

U. S. IMPORTED 660,386 TONS OF NATURAL RUBBER IN 1949

The United States imported 660,386 long tons of natural rubber in 1949, according to preliminary statistics reported by the U. S. Department of Commerce recently. For the first 10 months of 1949 it appeared that the total for the year might be 100,000 tons less than the 1948 total of 735,340 tons. This conclusion was based on Bureau of Census figures which showed that from July through October imports averaged only 47,000 tons per month with a 10-month total of only 526,000 tons. However, heavy imports in November and December, amounting to about 67,000 tons each month, raised the year's total beyond expectations.

The 1949 import figure was exceeded in three other years, in addition to 1948. In 1947 imports ran to 711,513 tons; in 1941, to 1,029,176 tons; and in 1940, to 818,624 tons. The 1949 imports, however, were well above the prewar (1935-39) average of 493,500 tons. The 1949 total included 29,753 tons of latex compared with 32,745 tons in 1948, 34,798 tons in 1941, and 33,789 tons in 1940. U. S. latex consumption in the first 10 months of 1949 totaled 31,037 tons, exceeding imports for the whole year.

The average declared value of imports in 1949 was 22.28 cents per pound for latex, and 15.95 cents per pound for other crude rubber. The average New York spot price for No. 1 ribbed smoked sheet for 1949 was 17.6 cents per pound.

The accompanying table shows 1949 tonnage imports of natural rubber into the United States from the principal producing countries. British Malaya and Liberia supplied 97 per cent of the latex. Indonesia was an important pre-war source, but output in that country has not yet been resumed on the former scale.

Malaya, as usual, was the number one source of rubber, supplying 47.1 per cent of our total imports, including latex. Indonesia, the world's second largest producer, supplied 27.0 per cent of the total. Receipts of 98,000 tons from Siam, 14.9 per cent of the total, were the largest in history and were greater than that country's total estimated exports in 1948, which were at the record level of 96,000 tons. Ceylon supplied 6.3 per cent and was our fourth largest supplier, and Liberia with 3.9 per cent was our fifth.

The order was the same as in 1948, but in that year, when Malayan production was at its peak of 698,000 tons, as against about 670,000 tons in 1949, Malaya supplied 61.6 per cent of our total rubber imports, Indonesia 15.4 per cent, Siam 11.0 per cent, Ceylon 7.4 per cent, and Liberia 3.4 per cent.

1949 IMPORTS OF NATURAL RUBBER INTO THE UNITED STATES

	1948	1949
Latex:		
British Malaya	25,102	22,142
Indonesia	423	628
Ceylon	109	161
Liberia	7,110	6,800
Others	1	22
Total	32,745	29,753
Guayule: (Mexico)	302	none
Other Crude Rubber:		
British Malaya	427,652	289,128
Indonesia	112,872	177,949
Siam	80,555	98,254
Ceylon	54,447	41,538
French Indochina	5,334	1,869
Republic of the Philippines	1,023	935
Other Asia and Oceania	433	337
Liberia	17,769	18,902
Belgian Congo	1,333	1,102
Other Africa	842	309
Central and South America	33	310
Total	702,293	630,633
Grand Total	735,340	660,386

Diamond Forms Export Division

Diamond Alkali Co., Cleveland, Ohio, has formed an Export Sales Division to coordinate foreign sales of alkalis and related chemicals. The new division will handle export sales of "Tanolin" sodium bichromate and specialized oils for leather processing. It will also handle foreign sales of precipitated calcium carbonates, carbon tetrachloride and detergent cleansers. S. S. Savage will head the new division as director of export sales.

Establish Synthesis Department

Formation of a Chemicals and Fuels Synthesis Department has been announced by the Blaw-Knox Co., Pittsburgh, Penna. The work of the department will deal principally with the conversion of fuels into chemicals based initially on the Fischer-Tropsch and related processes. Arrangements have been completed with two German firms, Ruhrchemie and Lurgi, for licenses and access to all process information they have developed. Ruhrchemie pioneered the development of the Fischer-Tropsch processes as used in Germany's manufacture of gasoline from synthesis obtained from coal. Lurgi built plants of this type in Germany and contributed to coal gasification. The new Blaw-Knox department will be staffed by engineers from the company's Chemical Plants Division. The new department will adapt processes, develop pilot plants, design equipment, provide engineering and build plants for the conversion of plentiful fuels into more valuable chemical materials and upgraded forms of hydrocarbons.

Dry-Flow Detackifying Agent

National Starch Products, Inc., New York, N. Y., has announced the development of Dry-Flow, a finely-divided powder of such texture that it is said to flow like water. The product is hydrophobic, and therefore is not wetted by water. It cannot be gelatinized by heating in water, and floats on the surface of water without clumping. Potential applications for Dry-Flow include rubber dusting, detackifying agent for rubber articles formed by the dip method, lubricating agent, flatting agent in lacquers, etc.

1949 CARBON BLACK SHIPMENTS DECLINED 10% FROM 1948 TOTALS

According to the U. S. Bureau of Mines, shipments of all types of carbon black during 1949 totaled 1,127,322,000 pounds, a decrease of 10% from the 1948 total of 1,253,081,000 pounds. Production of carbon black during 1949 dropped 5.7% with 1,223,440,000 pounds against 1,296,997,000 pounds. Producers' stocks at the end of 1949 stood at 212,438,000 pounds, an increase of 82.8% over the 116,320,000 pounds on hand at the end of 1948.

During 1949, 627,369,000 pounds of channel black and 596,071,000 pounds of furnace black were produced, compared with the 676,397,000 pounds of channel and 620,600,000 pounds of furnace which were produced during 1948. Shipments of channel black in 1949 totaled 535,921,000 pounds, while shipments of furnace black amounted to 591,401,000 pounds. In 1948, 657,229,000 pounds of channel and 595,852,000 pounds of furnace were shipped. At the end of 1949, 117,572,000 pounds of channel and 94,866,000 pounds of furnace were on hand compared with the 26,124,000 pounds of channel and 90,196,000 pounds of furnace on hand at the end of the preceding year.

In the first eleven months of 1949, 187,521,000 pounds of channel black and 89,024,000 pounds of furnace black were exported for a total of 276,545,000 pounds. In the first eleven months of the preceding year, a total of 298,790,000 pounds of black were exported. Breakdown totals for exports of channel and furnace black in 1948 are not available.

Research Institute Annual Report

Midwest Research Institute, Kansas City, Mo., has issued its annual report for 1949 covering the activities of the organization during the year. The 1949 report marks the completion of five years of service to industry. The beginnings of the Institute and general facts concerning present personnel, equipment and operations are outlined in the report. The different research programs in industrial chemistry, biochemistry, physical measurements, mathematical analysis, chemical formulation and analysis, instrumentation and electronics, metallurgical research, and research design are covered in the report. The report, which has been prepared in attractive booklet style, also lists the trustees of the organization, and the companies, individuals and organizations served by the Institute during 1949.

Condenser Service Catalogs

Condenser Service & Engineering Co., Inc., Seaboard Trust Building, Hoboken, N. J., has published a series of catalogs which are available upon request to the company. The catalogs include "Steam Condensers," "Steam Jet Air Ejectors," "Oil and Water Coolers," "Packaged Power Boilers," and "Centrifugal and Piston Pumps." All the catalogs describe the units indicated and offer photographs, engineering drawings, tables, charts and other illustrative material.

GOVERNMENT SCIENTISTS DEVELOP RUBBER MADE FROM TURPENTINE

A new type of high-quality synthetic rubber, made with a chemical derived from turpentine, has been developed by scientists of the Bureau of Agricultural and Industrial Chemistry of the U. S. Department of Agriculture. This achievement, a result of work begun during the war by the Bureau's Naval Stores Research Division, makes it possible to use turpentine as a supplementary source of synthetic rubber in a national emergency. Under present conditions rubber from turpentine is somewhat more costly than GR-S, the most common synthetic rubber now produced commercially. But the new synthetic, compounded for use in tires, is slightly stronger than GR-S rubber, stretches better, and generates less heat under stress.

Elastomer Ingredients

Main ingredient of the new elastomer is isoprene, a compound that forms the basic molecular unit of natural rubber. It is obtained from turpentine by a special molecule-splitting process developed by Bureau researchers. Isoprene produced from petroleum is already used in some types of synthetic rubber now on the market. The Bureau's method of producing it from turpentine should be a valuable national asset in the event of emergency shortages of petroleum.

First step in synthesizing rubber from turpentine is to produce isoprene from the turpentine's hydrocarbon constituents, called terpenes. Each molecule of isoprene has 5 atoms of carbon and 8 atoms of hydrogen. Terpene molecules are made of exactly twice this number of atoms—10 of carbon and 16 of hydrogen. Scientists of the Naval Stores Research Division devised a process for splitting the terpene molecule in half to obtain two molecules of isoprene.

This is done by immersing a conductor of high-resistance iron wire, heated red hot by an electric current, in boiling turpentine. The liquid vaporizes around this conductor and is heated to about 1400° F. When terpene molecules in the vapor strike the wire at this temperature they are split in two. The split molecules—isoprene—immediately bounce off into the liquid turpentine, which cools them sufficiently (even though it is boiling) to prevent further decomposition.

Continuous Distillation

A continuous, two-stage distillation process removes the newly formed isoprene molecules from the turpentine bath and keeps them from again touching the red-hot wire. A water-cooled condenser first liquefies some of the vapors from the bath to unchanged turpentine, which is returned for further treatment. The remaining vapors, containing the isoprene, pass to a second condenser where they are liquefied with solid carbon dioxide ("dry ice"). This procedure gives a 70-per cent yield of isoprene that is about 95-per cent pure. It is made 99-per cent pure by redistillation.

In producing synthetic rubber, the purified isoprene (either alone or in combination with styrene, a compound used also in GR-S rubber) is mixed with water, soap, a catalyst, and a modifier, and shaken for a specified time at a warm temperature. One formula, found to yield approximately 80 per cent of high-quality synthetic rubber suitable for use in tires, calls for 75 parts (by weight) of isoprene, 25 parts styrene, 180 parts water, 5 parts soap, 3/10 part potassium persulfate (as a catalyst for the copolymerization of the isoprene and styrene), and 2/10 part mercaptan (which regulates the polymerizing action). This mixture is shaken for 14 hours at a temperature of about 120° F. The resulting synthetic rubber has a tensile strength of about 3,800 pounds per square inch, will stretch to 7 times its length, and in standard tests develops 7 to 18 degrees (F.) less heat under stress than similarly produced and compounded GR-S rubber.

H. Muehlstein Moves Offices

H. Muehlstein & Co., Inc., have moved their general offices from 122 East 42nd St. to the Lincoln Building at 60 East 42nd St., New York 17, N. Y., where they will occupy the entire 46th floor. The new telephone number of the company is MUrray Hill 7-1400.

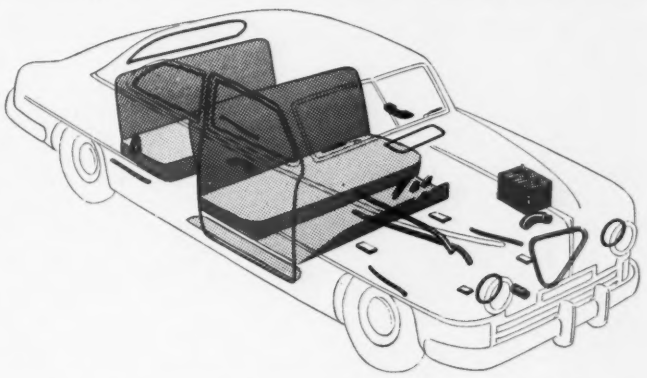
To Produce Silicones in France

A new company to promote the commercial development of silicones in France is being formed by the Dow Corning Corporation of Midland, Mich. It will be a joint venture with the firm of St. Gobain, Chauny et Cirey of Paris, which for several years has acted as a distributor of silicone products in France. The new company will continue to import raw materials and certain finished products from Dow Corning until such time as it can establish its own production of various products, including electrical insulating compounds and mold lubricants for rubber and plastics. The new company is being organized with ECA cooperation.

Buys Interlake Resin Plant

The Acme Resin Corporation, a newly-formed organization, has purchased the liquid resin plant of the Interlake Chemical Corporation at Forest Park, Ill. Myron T. Bennett, formerly vice-president in charge of sales for Interlake Chemical, is president of Acme Resin. Mr. Bennett is well known to the rubber industry through his previous associations with the N. J. Zinc Co. and the United Carbon Co.

ESTIMATES SHOW MODERN AUTOMOBILE USES 94 TO 143 POUNDS OF RUBBER



Artist's drawing of a "phantom" automobile shows a few of the 350 to 400 rubber parts that are used in the 1950 model cars, exclusive of tires and tubes. Extruded and molded rubber parts in the modern automobile weigh from 70 to 100 pounds, an amazing increase over the three pounds of such rubber parts used in the automobile of 1925.

Owners of 1950 automobiles are riding around on a cushion of 94 to 143 pounds of rubber (depending on the model), according to a recent study by engineers of the Goodyear Tire & Rubber Company. Rubber parts, such as weatherstrip for windshields and windows, floor mats, dust seals; accelerator, clutch and brake pedals; rubber arm rests, windshield wipers, body shims, motor mounts, fan belt, radiator and heater hose, battery boxes, lamp gaskets, airfoam seats, etc., account for 70 to 100 pounds of rubber, while tires and tubes range from 24 to 43 pounds, depending on size and style.

Increasing importance of rubber's role in car safety, cushioning, noise reduction, vibration dampening and insulation from heat, cold and rain is seen in a comparison of figures spanning 25 years tallied by Goodyear engineers. In 1925, the average car used about three pounds of rubber, in addition to tires and tubes. Today there are 350 to 400 rubber parts in the modern car, weighing 70 to 100 pounds, exclusive of tires and tubes.

GOODYEAR SURVEY INDICATES HIGHER TIRE SALES IN 1950

A note of optimism for tire dealers and other tire sales outlets is contained in results of a nationwide survey made recently (1949) by the Goodyear Tire & Rubber Company. The survey, taken in each of the 48 states, duplicates a similar one by the company in 1948. It reveals among other things that sales of replacement tires in 1950 should run about 15 per cent higher than the current year.

In taking the potential tire replacement sample, all tires observed were checked for condition of wear—whether having well defined tread, slight trace of tread, or smooth. Those failing in the latter two categories were noted as running at least 15 per cent above 1948, indicating this increased number probably would be replaced during the coming year. Each year the same number of cars was sampled.

It should also be interesting to note the gain shown for the current year over 1948 in the number of low pressure tires (Super-Cushion and others) in operation. The number is now more than three times greater. Showing the largest increase in this classification is the 6.70-15 size, replacing as original equipment the 6.00-16 conventional tire. The former is now on the majority of the lower priced new cars and the number of units in use is rapidly increasing. This will become more pronounced as older model autos continue to go out of service. Still leading the low pressure tire replacements at present, however, is the 6.70-16 size.

Conventional Size Popularity

While the survey showed the old standby in conventional sizes—6.00-16—as still the most popular, it has declined from its 1948 position when it constituted two-thirds of all passenger tires on the highway. The new report shows this size now comprises only about one-half the passenger tires in service. Not taken into consideration was the fact that car registration this year is approximately 19 per cent ahead of 1948, making the potential sales replacement picture even brighter. The public also prefers best quality tires, the report plainly reveals, since some 80 per cent of tires observed were so-called first line tires.

Possibly of some significance regarding buying habits is the survey's indication that there is a slightly greater trend towards even heavier car registration in metropolitan areas than in 1948. The survey was broken down according to three areas: metropolitan (cities over 100,000), intermediate and rural, the latter with counties having no town registering more than 2,500 cars.

In 1949 the metropolitan group gained three per cent, with rural and intermediate registration declining two and one per cent, respectively. This applies only to relative per cent gain, all three areas having higher overall car ownership than in the previous year.

G. M. Sprowls, manager of Goodyear's highway transportation department, and responsible for the survey, says particular pains were taken to obtain a good cross section of the country.

Dugall Joins Kaiser Aluminum

J. T. Dugall

J. T. Dugall, formerly plant manager of the Rome, N. Y., plant of the General Cable Corp., has joined the Kaiser Aluminum and Chemical Co. as plant manager of the Kaiser Aluminum Cable plant at Newark, Ohio. Mr. Dugall has a background of more than 15 years in the insulated wire and cable industry in the United States. Born and raised at Pawtucket, R. I., his career started with the Collyer Insulated Wire Co. of Pawtucket. Until 1935 he was employed in its factory and laboratory. From 1935 to 1940, he served in the capacity of rubber technician with John A. Roebling Sons Co., Trenton 2, N. J. Mr. Dugall joined General Cable in 1940 at the Perth Amboy plant in New Jersey. He first served as a rubber technician and was subsequently employed as superintendent of the rubber mill, production superintendent, and plant superintendent of the Perth Amboy plant. From 1946 until 1948 he served as plant manager of General Cable's St. Louis, Mo., plant. Mr. Dougall attended Brown University, graduating in 1932 with a Ph.D. degree in chemistry. He is a member of the American Society for Testing Materials.

At the same time, announcement was made of the appointment of A. S. Basil as assistant general sales manager to direct the national sales of Kaiser Aluminum electrical wire and cable products. Mr. Basil was formerly associated with U. S. Rubber, where he had more than 23 years of experience in the wire and electrical industry, including service as general sales manager of its Wire and Cable Department. He is a graduate of Rensselaer Polytechnic Institute, and a member of the American Institute of Electrical Engineers.

Publication of a revised edition of "Products and Services for Industry and Agriculture" has been announced by the American Cyanamid Co. The 64-page illustrated book briefly describes the products and services offered by the company and outlines the divisional structure through which such products are sold.

CASING SHIPMENTS IN NOVEMBER DECLINE 22.99% FROM OCTOBER

Manufacturers' shipments of automotive casings in November totaled 5,267,414 units, a drop of 22.99% from the 6,839,604 casings shipped in October. These figures break down to indicate that in November 4,371,069 passenger casings and 896,345 truck and bus casings were shipped. During the previous month, 5,784,685 passenger casings and 1,054,919 truck and bus casings were shipped. The figures are estimated in a monthly report of the Rubber Manufacturers Association.

A total of 6,039,799 automotive casings were produced in November, including 5,135,411 passenger casings and 904,388 truck and bus casings. These figures compare with the totals for October when casings produced totaled 6,500,017 units, including 5,621,182 passenger casings and 878,835 truck and bus casings.

As of November 30, 1949, there were 9,541,994 automotive casings on hand, including 7,867,378 passenger casings and 1,674,616 truck and bus casings. At the end of the preceding month there were 8,674,882 automotive casings on hand, including 7,015,899 passenger casings and 1,658,983 truck and bus casings.

Passenger and truck and bus tubes shipped during November totaled 4,216,419 units, a drop of 24.13% from the 5,557,104 tubes shipped in October. During November, 5,154,605 tubes were produced, against the 5,295,630 produced the month before. At the end of November there were 9,645,004 tubes on hand, contrasted with the 8,643,678 tubes on hand at the end of October.

New Use for Rubber Tubing

A new and novel use for rubber tubing is reported by the B. F. Goodrich Co., Akron, Ohio. Goodrich is making the tubing employed in a new milk dispensing system developed by Norris Dispensers, Inc., Chicago, Ill., now being used in many food serving establishments. Each piece of sterile tubing, wrapped in film to insure non-contamination, is for single use and is attached to the bottom of a special dairy-sealed, five-gallon can devised for use with the system. When the can of milk is placed in the fully refrigerated cabinet for use, the single-service tube is drawn through the valve and the sealed end snipped off. The milk is then ready to be drawn from the cans into glasses by operating the wrist lift counter weighted valve, or an optional type push valve. The Norris Dispenser meets requirements of U. S. Public Health Regulations.

Folder on Georgia Marble Co.

The Calcium Products Division of the Georgia Marble Co., Tate, Ga., has published an eight-page folder describing the facilities and products of the company. The various quarries, mills and other facilities of the company are illustrated, as are several of the units utilized in the manufacture of the division's products. Copies of the booklet are available upon request to the company.

CROWELL-COLLIER TIRE SURVEY STUDIES 1949 MARKET TRENDS

According to the 1949 Tire Survey published by the Research Department of the Crowell-Collier Publishing Co., New York 19, N. Y., the fourth one made by the company, passenger car owners indicated less need for replacement tires for the last six months of 1949 than they stated for the last six months of 1948 (11%, or 18,200,000 tires against 14%, or 20,900,000 tires). The Rubber Manufacturers Association figures indicate that this decrease in demand for replacement shipments is offset by increases for original equipment. But clearly the backlog of demand for replacement tires caused by the war-time freeze has been satisfied.

The fourth annual report states that the influx of new cars on the road is reflected in the fact that, in 1949, 49% of all tires in use were original equipment as against 39% in 1948, 34% in 1947 and 30% in 1946.

Of the car owning families, 78% reported on their last tire purchase. The average purchase by these was 2.4 tires. Of these, 29% bought one tire, 37% bought two tires, 4% bought three tires, 22% bought 4 tires, and 8% bought 5 tires. Of all the tires on the road, only 51% are replacements bought by present car owners as against 61% for 1948. Among cars bought new, 42% of the tires have been replaced; among cars bought used, 60% are replacements.

The Crowell-Collier Survey indicates that of the cars bought new, only 8% of the tires on cars driven under 20,000 miles have been replaced; 51% of the tires on cars driven between 20,000 and 40,000 miles; 79% of the tires on cars driven between 40,000 and 60,000 miles; 89% of the tires on cars driven between 60,000 and 80,000 miles; and 91% of the tires on cars driven over 80,000 miles. (Some tires on 80,000-mile vehicles may have been spares part of that mileage; or recaps.)

Percentage of Recaps

Only 8% of the total cars have at least one recapped tire as against 15% in 1948, 31% in 1947 and 55% in 1946. Only 4% of the total tires are recaps as against 6% in 1948, 14% in 1947 and 31% in 1946. Among the cars with recaps, 45% have only one recap, 25% have two, 12% have three, 6% have four, and 12% have five recaps.

The 1948 tire study showed nationally advertised makes of tires to be far ahead of other brands on three bases of comparison. The 1949 study shows nationally advertised makes to be increasing their leadership. Of the total tires now on the road, 78% are nationally advertised makes as against 73% in 1948. Of the tires bought as replacements, 66% are nationally advertised makes as against 64% in 1948. Of the tires to be purchased, 83% are nationally advertised brands as compared with 76% in 1948.

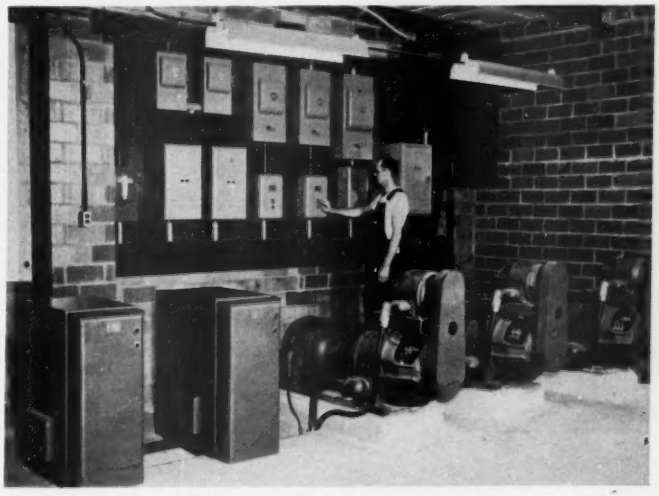
In the United States, 8% of the total car owners used snow treads on their tires last year. Of these, 84% say they will use them next year. Of those who did not try snow treads last year, 3% say they will try them this year. Of the new users, 32% will have old tires recapped, 58% will buy new tires and 10% have not as yet decided. In all, about 9% of the total car owners will use snow treads this year, the report states.

Of the 19% who stated they are going to buy a special type tube on their next purchase, 46% said they would buy the puncture sealing type, 43% said they would buy the blowout protection type and 11% said they did not know. Of the 72% of the total car owners who reported on their last tube replacement purchase, 36% bought one tube, 33% bought two tubes, 3% bought three tubes, 20% bought four tubes and 8% bought five tubes. Of the persons who reported on their last tire purchase and their last tube purchase, 78% stated that they bought the tire and tube at the same time; 22% bought the tire and tube at separate times.

Dewey and Almy French Plant

Plans for the opening of a plant in France to manufacture can sealing compounds and other products have been announced by the Dewy and Almy Chemical Co., Camridge, Mass. The plant will be located in Epernon, which is in the vicinity of Paris, with Henry Wasner, Dewey and Almy's managing director in London, supervising operations which are expected to begin this summer. A subsidiary, to be called Darex S. A. R. L., has been set up to operate the plant. Dewy and Almy receives 51% of the stock, principally in return for the contribution of manufacturing "know how," formulas and business already developed in France. The formation of the new company has been approved by the French Government. In addition to sealing compounds for the French canning industry, the plant will manufacture fluxes used in soldering of cans, radiators, and other objects.

G-E SPEED VARIATORS INSTALLED AT CHARDON RUBBER COMPANY



This photograph shows the line-up of two 5/7-hp "packaged" Speed Variators, and three "open" sets. Operator is at panel controls for open sets. The control for the packaged unit is contained in the power unit.

Two 5/7½-hp General Electric Speed Variators were installed recently at the Chardon Rubber Co., Chardon, Ohio, for driving tubing machines. The use of Speed Variators makes possible the wide range of driving speed which is needed for extruding the myriad types and sizes of rubber required for the wide variety of mechanical rubber goods produced by this company.

The Chardon Rubber Co., manufacturers of mechanical rubber goods and rubber tubing for industrial use, are using the new G-E Speed Variators to provide a more flexible system of individual machine operation. It is also reported that the new units minimize space requirements because of their compact unit design and also eliminate the need for conventional, separately mounted control panels, conduit, and wiring.

The Speed Variators, General Electric's new "package" model of the individual motor-generator set, were easily installed, according to a G-E spokesman, who stated that no grouted cement foundation is needed. He explained that the package may be simply set on the floor at any desired distance from the drive motor or the operator's position. Additional advantages mentioned were that this arrangement minimizes the possibility of plant shutdown. Since the units are independent of a common motor-generator source, single unit failure will not affect all units on the line. Also, maintenance on the "package" is held to a minimum because it is cooled by filtered air.

NAMES IN THE NEWS

ALBERT M. KAHN, president of Consolidated Products Co. and the Acme-Hamilton Rubber Manufacturing Co., has been named chairman of the Greater New York Combined Campaign for Reform Judaism.

CLARK NOONAN, personnel manager of the Cooper Tire & Rubber Co., has been elected president of the Personnel Men's Club of Findlay, Ohio.

RICHARD O. ZERBE, associated with the Monsanto Chemical Co. since 1936, has been placed in charge of the patent work of the Rubber Service Department of the company at Nitro, W. Va.

DR. IRVING LANGMUIR, associate director of the Research Laboratory of the General Electric Co. at Schenectady, N. Y., and associated with the company for more than 40 years, has retired. He will, however, continue work in the laboratory as a consultant.

DAVID E. ALLEN has been appointed sales manager of the Anaconda Wire & Cable Co. In his new position he will be assistant to L. R. LOVE, general sales manager of the company.

THOMAS D. CABOT, vice-president, treasurer and a director of Godfrey L. Cabot, Inc., has been elected to the board of directors of the John Hancock Mutual Life Insurance Co.

CHARLES T. POTTS has been named manager of the Shoe Products Department of the Armstrong Cork Co., succeeding H. C. STOUFFER, who has resigned.

PAUL F. NIESSEN, assistant general works manager, and for the past five years director of research and development for the Victor Manufacturing & Gasket Co., has been elected to the board of directors of the company.

BERNARD H. CAPEN, formerly chief chemist of the Tyer Rubber Co., Andover, Mass., has been named technical superintendent of that company. JOHN E. SUNDERLAND, who has been associated with the company for the past year or so, has been named product engineer.

DR. WILLIAM LEE DAVIDSON, director of physical research for the B. F. Goodrich Co., has been selected as one of Ohio's five outstanding young men of 1949 by the Ohio Junior Chamber of Commerce.

FRANK G. BREYER, member of the consulting metallurgical and chemical engineering firm of Singmaster & Breyer, New York, N. Y., has been awarded honorary membership in the American Institute of Chemists.

HASKELL H. FRITTS, associated with the Southern Shellac Manufacturing Co. for the past two years, has returned to the Baker Caster Oil Co. as vice-president and director of sales. He will be located at the company's head office in New York City.

RICHARD A. PARSEKIAN, who has had over 12 years experience in research and development and technical service with Warwick Chemical, Flintkote and Columbian Carbon, has joined the staff of the Pioneer Latex & Chemical Co., Middlesex, N. J. He will be in charge of the development and sales of vinyl resin dispersions.

T. A. WERKENTHIN, principal materials engineer, Bureau of Ships, Navy Department, has been selected to represent the Washington Rubber Group at meetings of the Rubber Division, A.C.S.

H. F. MCFARLAND, until recently superintendent of the Diamond Wire & Cable Co., Sycamore, Ill., has been named purchasing agent of the company, succeeding JOHN E. HALLBERG, who has retired.

DAVID A. PATERSON, a senior partner of H. A. Astlett & Co. of New York, and who has been active in the import and export business in New York for over forty years, has been elected a member of the board of directors of the General Latex & Chemical Corp., Cambridge, Mass.

C. B. ROBINSON, vice-president of the Wyandotte Chemicals Corp. in charge of the J. B. Ford Division, and associated with the Ford unit since 1917, has retired. He will continue to serve Wyandotte as a sales consultant.

ROBERT KEMP has been appointed sales manager of the automotive products division of Allen Industries, Inc., Detroit, Mich. AUGUST DECAREY has been named chief engineer of the company.

MARTIN V. COFFEY, previously sales manager of the Miami Cabinet Division of the Philip Carey Manufacturing Co., Cincinnati, Ohio, has been appointed general sales manager of the company.

RAYMOND C. FIRESTONE, vice-president in charge of research and development of the Firestone Tire & Rubber Co., has been elected a director of the Firestone Bank, succeeding his brother, RUSSELL A. FIRESTONE, who now lives in New York City.

W. H. WRIGHT, well known rubber technologist, both in this country and abroad, has joined the Norwalk Tire & Rubber Co., Norwalk, Conn., as chief chemist.

DAVID DOUGLAS HALDANE, vice-president of Littlejohn & Co., has been elected to the Board of Governors of the Commodity Exchange, Inc., New York, N. Y., to represent the Rubber Trade Group.

Lang Joins Vulcan Proofing

Otto J. Lang

Otto J. Lang has joined the staff of the Vulcan Proofing Company of Brooklyn, N. Y., as Director of Development and Research. Vulcan manufacturers printers blankets, industrial diaphragms of all types, Government specification goods, etc. A considerable expansion of laboratory facilities and personnel is under way. Mr. Lang was for a number of years Chief Chemist and Head of the Technical Division of the Armstrong Rubber Company of West Haven, Connecticut, and represented that company on various technical committees including the Tire and Tube Technical Consulting Committee, the Ordnance Advisory Committee and the S.T.C. He also represented the company on the Tire and Rim Association and the A.S.T.M. He was a member and served as Chairman of the Copolymer Technical Committee which, in cooperation with the Copolymer Corporation of Baton Rouge, first brought the development of "cold" rubber to the commercial production stage. Before joining Armstrong, Mr. Lang was with the B. F. Goodrich Company at Akron and Mexico City. He is a member of the American Chemical Society and of the Connecticut and New York Rubber Groups and has served on the Executive Committee of the latter group.

ALBERT A. GARTHWAITE, president and general manager of the Lee Rubber and Tire Corp., has been elected a member of the board of directors of Universal Pictures Co., Inc.

PAUL S. BRALLIER, formerly plant manager of the Niagara Falls, N. Y., plant of the Stauffer Chemical Co., has been appointed to the post of director of market development for the company.

ELMER C. SCHACHT has been elected president of the Behr-Manning Corporation, a division of the Norton Co., manufacturers of coated abrasives and electrotextiles.

Hot Tips on Cold Rubber:

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2. CARBON-GEL
3. WEAR
4. FLEX LIFE

4 BEST FLEX LIFE
because of:

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- **b** Freedom from Oxidative Catalysis
- **c** Highest Resilient Energy
- **d** Highest Elongation with Optimum Modulus

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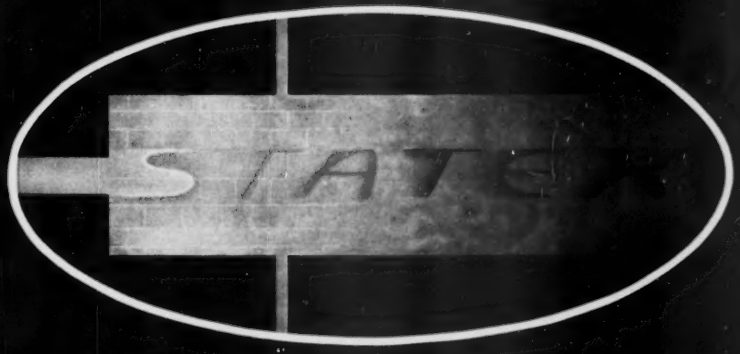

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Hold 40th Motor Boat Show

Capacity crowds attended the 40th Annual National Motor Boat Show, held at Grand Central Palace in New York City from January 6 to 14 under the sponsorship of the National Association of Engine and Boat Manufacturers, Inc. Five separate forums were held during the show on such subjects as sail boat racing, outboarding, and group boating interests. Over 100 exhibitors were on hand, displaying their wares on the main floor and second, third and fourth floors of the Palace.

Several exhibits were devoted to rubber accessories for boats of all kinds, particularly foam rubber for mattress and upholstery purposes. Firestone's Foamex was displayed by the East New York Canvas Products Co., of Brooklyn, N. Y., which sells the material under the brand name of "Ease Foam." This company also exhibited its Essar line of bouyant rubber fenders. U. S. Rubber's Koylon material was shown by the Geschwind Foam Rubber Co., also of Brooklyn. Goodyear's Airfoam was displayed by the M. W. Fogg Co., Inc., of New York.

A number of the exhibitors displayed special rubber accessories for their own boats and canoes. One of these was the Grumman Aircraft Engineering Co., of Beth Page, L. I., N. Y., which displayed, among other items, rubber matting, short rubber gunwale covers and foam rubber seat cushions for its line of aluminum canoes.

Other exhibits of special interest included the Goodrich cutless rubber bearings, displayed by Lucian Q. Moffitt, Inc., of Akron, and the Willis rotary rubber bearing shown by the E. J. Willis Co. of New York.

Goodyear Pension Plan Set

A pension agreement, the cost of which is to be borne by the company, was reached on January 31 by the Goodyear Tire & Rubber Co. and the United Rubber Workers. It calls for $100 monthly minimum benefits, including social security, at the age of 65 after 25 years of service. The agreement, expected to cost Goodyear about 10 cents per hour per employee, covers 24,000 workers in 10 plants. Including 13,500 in Akron. The plan becomes effective on April 1. Pension talks are also proceeding with various other rubber companies.

Reduce Prices on Hi-Sil

W. I. Galliher, executive sales manager of the Columbia Chemical Division of Pittsburgh Plate Glass Co., has announced that as of February 1 Columbia will sell Hi-Sil, its new fine particle silica pigment, at 11c per pound in carloads or 10-ton truckloads and 12c per pound in less than carload lots. These prices now apply to all domestic contract and spot sales. The price reduction is said to have been made possible by increased production resulting from the acceptance of the material by the industry.

FINANCIAL NEWS

Dayton Rubber Company

Year Ended October 31: Net loss of $83,106, compared with net profit of $743,870, or $1.44 per common share, for the previous fiscal year. Net sales for the current period amounted to $23,528,342 compared with the previous year's net sales of $27,327,674. The balance sheet as of October 31, 1949, indicated current assets of $9,157,615 against current liabilities of $3,310,728. The loss sustained for the last fiscal year was attributed to unsettled conditions in the tire replacement field.

Armstrong Rubber Co.

Year to September 30: Net profit of $656,287, which is equal to $1.51 a class A and B share, compared with $1,597,930, or $4.35 a combined share, in the preceding fiscal year.

National-Standard Co.

Year to September 30: Net profit of $712,125, which is equal to $2.12 a share, contrasted with $1,453,628, or $4.33 a share, in the previous fiscal year.

Hearings on Tire Discounts

Hearings on the proposal of the Federal Trade Commission to fix a 20,000-pound carload limit for quantity discounts on replacement tires and tubes were scheduled to start in Washington, D. C., on February 10. A preliminary restraining order to prevent the FTC from proceeding with its carload limit decision was sought in separate suits filed by U. S. Rubber, Goodyear, Goodrich, Firestone and Montgomery-Ward, but all of these pleas were dismissed by Federal District Court Judge B. S. Matthews in Washington, D. C., on January 19. In dismissing the pleas, Judge Matthews stated "the time for judicial review of the administrative proceedings in the Federal Trade Commission is not ripe." Numerous briefs have been filed with FTC both pro and con. The "Big Four" contend that adoption of the rule would not help small dealers, would boost retail tire prices, impede the development of better tires, and generally play havoc with the industry's present distribution.

Appoint Coast Representatives

Walter H. Del Mar and the W. H. Del Mar Co., 5140 Crenshaw Boulevard, Los Angeles, Calif., have been appointed Pacific Coast representatives of the Standard Machinery Co., Mystic, Conn., manufacturers of extruding machines and accessories for the rubber, plastics and wire industries. Mr. Del Mar, who also represents the Adamson United Co., has a broad, practical background in the machinery field.

Changes Announced By DuPont

The following changes in assignments in the sales and technical personnel of the DuPont Rubber Chemicals Division became effective on February 1: H. J. Jordan continues as rubber chemicals salesman, San Francisco office, reporting to A. J. Mease, but will reside in Los Angeles and be responsible for all West Coast rubber chemicals accounts and for supervision of the Los Angeles office and warehouse; A. J. Hawkins, Jr., transferred from salesman, San Francisco office, to salesman, Chicago office, reporting to J. A. Turner; J. B. Ledden, transferred from salesman, Chicago office, to salesman, Akron office, reporting to E. H. Krismann (Mr. Ledden's place of residence is to be determined but will probably be in the Detroit area); W. V. Sauter, transferred from technical demonstrator, Akron Laboratory, to Akron office salesman, reporting to E. H. Krismann; H. W. Day, transferred from salesman, New York office, to salesman, Boston office, reporting to W. H. Zillessen; A. H. Woodward, transferred from sales correspondent, Wilmington office, to salesman, New York office, reporting to S. M. Conn; R. S. Griffin, transferred from Sales Promotion Section to Direct Sales Section, Wilmington office, replacing A. H. Woodward and reporting to S. G. Byam; R. H. Barton, transferred from Rubber Laboratory to Sales Promotion Section, Wilmington office, reporting to V. A. Cosler.

Open Second Vinyl Film Plant

Ross & Roberts, Inc., manufacturers of vinyl film and sheeting, at West Haven, Conn., have announced the opening of a second plant, located in Stratford, Conn. Situated on an 8-acre tract along the main line of the New Haven Railroad, the new plant features the latest production equipment, including a four-roll calender of the "Z" type. An interesting feature of the plant is the isolation of all large motors from the main operating floor, these motors being located in a separate, pressurized room to insure the proper ventilation and protection of the high voltage equipment. The company is headed by Arthur M. Ross as president and Alvin V. Roberts, vice-president. The latter directs sales and technical service through Ross & Roberts Sales Co., Inc., 350 Fifth Ave., New York 1, N. Y.

Sharples Chemicals President

Paul Kendall, associated with Sharples Chemicals Inc., Philadelphia, Penna., for the past 23 years, and since 1941 executive vice-president of the firm, has been elected president succeeding P. T. Sharples, who has become chairman of the board. Lee H. Clark, vice-president in charge of production, has assumed the duties of executive vice-president. Mr. Kendall is also president of Sharples-Continental Corp. and a member of the board of the Sharples Corp.

Named Executive Vice-President

Clyde W. Gray

Embert W. Peterson, president of Stowe-Woodward, Inc., Newton Upper Falls, Mass., manufacturers of rubber-covered rolls and bowling balls, has announced the appointment of Clyde W. Gray as executive vice-president. Mr. Gray, an engineering graduate of the University of Kentucky, has had a wide range of experience and accomplishment in the manufacturing and management fields. He comes to Stowe-Woodward directly from his most recent connection with Ford, Bacon & Davis, industrial and management engineers, for whom he not only served a large industrial clientele, but functioned as general manager of the company's Atomic Bomb Operation at Oak Ridge, Tenn., in 1944 and 1945.

Spring Meeting Committee

Dr. G. M. Wolf (Sharples Chemicals), general chairman of the Local Committee on Arrangements for the Spring Meeting of the Division of Rubber Chemistry of the American Chemical Society, scheduled for April 19, 20, and 21 in Detroit, Mich., has announced the appointment of the following persons, all of whom are members of the Detroit Rubber Group, to the Local Committee: *Registration*, G. F. Lindner (Minnesota Mining); *Finance*, G. R. Cuthbertson (U. S. Rubber); *Banquet*, J. C. Dudley (Chrysler); *Meeting Room and Hospitality*, E. V. Hindle (U. S. Rubber); *Publicity*, G. P. Hollingsworth (Minnesota Mining); *Plant Trips*, R. J. Shroyer (Vanderbilt); *25-Year Club*, E. J. Kvet (Baldwin Rubber).

Reclaimers Elect New Officers

The annual meeting of the Rubber Reclaimers Association, Inc., held on January 17, in New York City, featured an election of officers for the 1950 season. The following members of the association were elected to office: *President*, Robert E. Casey (Naugatuck Chemical); *Vice-President*, D. S. Morse (Bloomingdale Rubber); *Secretary-Treasurer*, Charles T. Jansen (RUBBER AGE). Jean H. Nesbit, president of the U. S. Rubber Reclaiming Co., was reappointed chairman of the association's executive committee, a post he has held for the past several years.

Naugatuck Names Personnel

Appointment of personnel to manage the newly-acquired vinyl plastics operations of the Naugatuck Chemical Division of the United States Rubber Company, has been announced by John P. Coe, vice-president and general manager of the division.

Harold M. Parsekian has been named manager of vinyl sales and will direct a national sales organization under George R. Vila, Naugatuck Chemical's general product manager for colloids, plastics and agricultural chemicals. Clayton F. Ruebensaal will be vinyl operations manager, co-ordinating production, engineering and research. M. N. Hilseberg, as manager of the Baltimore office, will direct credit and traffic and take charge of orders and billing.

Similar positions were held by these three men in the Glenn L. Martin organization before sale of the operations to the rubber company. They and other members of the Baltimore office will be transferred to U. S. Rubber's Naugatuck Chemical division office in Naugatuck, Conn., as soon as possible, probably by early summer. In the interim, mail for the Marvinol vinyl plastics operations should be addressed to Naugatuck Chemical, 501 East Preston Street, Baltimore 2, Md.

The acquisition by the rubber company also includes the Marvinol plant, employing about 200, in Painesville, Ohio, where H. S. Curtis remains as plant superintendent and L. S. Howe as director of engineering.

Excello Combination Camelback

United Rubber Corp., Los Angeles, Calif., has announced a new camelback for truck tires, which is said to offer 30 to 60% longer wear. The new camelback, called Excello, is made of a combination of natural and synthetic cold rubber compounded to create a product with cool running, high tensile, and high abrasion properties. Besides the higher resistance to cuts and abrasions, it is reported to have a more stable tensile strength under conditions of excessive heat, and to retain the full non-skid, non-devulcanizing properties of natural rubber. At present the use of natural rubber in camelback is restricted to that which measures at least 5¾ inches across the tread. This limits the use of Excello, for the time being, to truck, tractor or larger commercial tires.

Avery Offers Consulting Service

Willis F. Avery, former secretary of the B. F. Goodrich Co., has opened an office at 326 South Main St., Akron, Ohio, as a consultant to the rubber industry and its suppliers. The services offered will include factual studies and analyses of specific problems dealing with managerial functions, production and sales and processing of machine and product research and development. The services will also be available for supplier-customer, manufacturer-government, and licensor-licensee relations. Mr. Avery retired from Goodrich last December 31 after more than 25 years' service during which he served as patent counsel and general counsel.

Juve Named Mohawk Executive

Robert D. Juve

Robert D. Juve has been named to the newly created post of executive assistant to N. E. Ries, factory manager of the Mohawk Rubber Co., Akron, Ohio. Mr. Juve will be in charge of all development and compounding. He was previously with the Goodyear Tire & Rubber Co. for ten years, where he worked on synthetic rubber research. He also spent a year as synthetic rubber coordinator and prior to his present appointment was doing research compounding in rubber and plastics. At the conclusion of World War II, Mr. Juve was a member of the first team to investigate German rubber plants for the Office of Rubber Reserve. He was graduated from Purdue University in 1939 with a B. S. degree in chemical engineering. Author of several technical papers, he is councilor of the Akron Section of the American Chemical Society and past secretary of that group. He is the son of the late Walter H. Juve, who was a well-known consulting rubber technologist.

Ferro Surface Active Agents

Ferro Chemical Corp. of Bedford, Ohio, has started production and is now offering a line of dispersing and surface acting agents called "Hypodynes." These acid esters of selected polybasic acids and their respective amine salts have been found to exhibit surface tension lowering and interfacial tension lowering comparable to that produced by highly active surface active agents, according to the company. The ability of these materials to disperse aggregates or micelles of polar substances, especially in organic systems, is said to be very effective as compared with other commercially available chemicals. The company said that the dispersive abilities, for example, have been utilized to alter the flow characteristics of vinyl dispersions and paint pigment concentrates and to solubilize high molecular weight organic materials which otherwise have proved insoluble in a wide variety of solvents. Ten different Hypodynes are being offered by the company.

DISCUSSES NON-RUBBER USES OF VARIOUS THIOKOL POLYMERS

The non-rubber uses of various Thickol polymers were discussed by Joseph W. Crosby, president of the Thiokol Corporation, at the meeting of the Northern California Rubber Group held on January 26 at the Hotel Claremont in Berkeley, Calif. A large number of members and guests were in attendance.

In opening his address, Mr. Crosby pointed out that although the possibilities and uses of crude synthetic rubber are fairly well known, the newer products, such as liquid polymers and water dispersions, are not so well known, and many are in fields unfamilar to rubber chemists. The bulk of the talk, therefore, consisted of a description of these new polymers and their varied applications.

Mr. Crosby first described the development of the liquid polymers, their possibilities, methods of compounding and vulcanization, and their solvent resistance. In many cases, he said, applications of these polymers are based on the physical state as well as solvent resistance characteristics, and he emphasized the fact that the polymers were the first "liquid rubbers" containing no solvents.

The first major applications of the Thiokol liquid polymers occurred during the war when they were used for the sealing of integral fuel tanks for aircraft and the caulking of flight decks for aircraft carriers. Peacetime applications include their use as deck and hull caulking compounds and sealants for aircraft, fuel tank and cabin sealers, potting compounds, adhesives, flexible molds, poured gaskets, resin modifiers, protective coatings, etc.

Mr. Crosby devoted the latter portion of his talk to a description of the development and application of water dispersions. These products, he stated, are dissimilar to true latices in that they have larger particle size, mechanical stability, and resistance to coagulation by acids, salts and water miscible solvents. He described many uses of the dispersions by themselves and in combination with other materials, such as the vinyl resins. Among these were water putties for special sealing application and linings for concrete underground gasoline storage tanks.

The final portion of the talk consisted of a description of the flame spray material used for protection against cavitation of struts, rudders and shafts of Navy ships.

Presenting Quality Control Course

Washington University of St. Louis, Mo., will again present its annual industrial quality control course from April 17 to 29 offering advanced training in management technique. Particular emphasis will be given to methods useful in applications to the chemical, rubber, paper, leather and other process industries. James H. Batchelor will be in charge of the course.

Retires from U. S. Industrial

Dr. Harry L. Fisher

Dr. Harry L. Fisher, who has been associated with U. S. Industrial Chemicals, Inc., since 1936 when he joined the company's development department, and who has been director of organic research for the past several years, has been retired by the company in accordance with its policy of retiring executives reaching the age of 65. Dr. Fisher's career includes seven years of activity with the B. F. Goodrich Co. and some ten years with U. S. Rubber. Dr. Fisher is currently located in Washington as administrative assistant in the Division of Chemistry and Chemical Technology of the National Research Council. The NRC is sponsoring the 16th Conference of the International Union of Pure and Applied Chemistry and the 12th International Congress of Pure and Applied Chemistry, both of which will be held in the United States in 1951. Dr. Fisher is in active charge of planning for both meetings. His headquarters are in the National Academy of Sciences Building, 2101 Constitution Ave., N. W., Washington 25, D. C.

Washington Group To See Movie

The Washington Rubber Group and the Department of the Army, through the cooperation of Loews' Theaters and Metro-Goldwyn-Mayer, will present a showing of the motion picture "Malaya" at the Pentagon Building in Washington on Tuesday evening, February 28. The picture, which dramatically recalls methods used to obtain natural rubber on an "informal basis" in the Far East during World War II, stars Spencer Tracy, Lionel Barrymore, James Stewart, and others. Permission to enter the Pentagon must be secured in advance.

Russell Manufacturing Co., Middletown, Conn., has announced that its Rusco fused fabric brake lining is now available for Ford and Chevrolet trucks.

QUEBEC GROUP HEARS WHITE ON COLD RUBBER INFLUENCES

The Quebec Rubber Group meeting of January 12, held at Canadian Legion Hall, Montreal, Que., Canada, was addressed by Dr. L. M. White of the Research and Development Staff of the U. S. Rubber Co. Dr. White spoke on "The Major Influences of Cold Rubber on the Industry." Approximately 60 members attended the meeting which was preceded by an informal dinner at Jamaica's Inn in Montreal.

Dr. White explained that cold rubber was a post-war development and represents a major advance over the old type of GR-S. Tensile, elongation, cut growth rate, tread cracking rate and wear resistance are all improved, he said. The difference in molecular structure between the old GR-S and the new cold rubber explains to some extent the differences in properties, he said.

The speaker emphasized that the use of fine furnace black is paramount in bringing out the desirable qualities of cold rubber. Without the development of fine furnace blacks, the use of cold rubber would have been greatly reduced. Dr. White stated that the advent of cold rubber has stimulated natural rubber producers to a point where they are improving on the qualities of natural rubber so that it will be more competitive with cold rubber. He explained, however, that cold rubber is not a replacement for natural but represents a new rubber raw material for industry.

Group Hears Government Panel

Over 100 members and guests, one of the largest attendances recorded to date, attended the meeting of the Washington Rubber Group at the Cosmos Club in Washington, D. C., on January 24. The meeting featured a panel discussion of the recent report submitted to President Truman by John R. Steelman on the maintenance of the synthetic rubber industry and disposal of government-owned facilities. The panel members included Frederick D. Bates, Jr. (Munitions Board), Earl W. Glen (Commerce Department), Gerald B. Hadlock (Rubber Reserve), and Arthur Wolf (National Security Resources Board). Mr. Hadlock, who acted as moderator for the panel group, first read the letter of transmittal which accompanied the Steelman report. The meeting was then thrown open for questions from the floor, and for more than a half hour the panel members attempted to answer specific questions, covering the whole gamut of the synthetic rubber problem. It was emphasized that the answers represented the personal opinions of the panel members, rather than official views. It was a most interesting meeting.

Harris Products Moves Offices

The Harris Products Co. has announced the removal of its main offices and plant to new and larger quarters at 1929 East 61st Street, Cleveland 3, Ohio. The phone number is Express 2600. The company also recently enlarged its rubber plant at Milan, Ohio.

HEWITT FOAM RUBBER SURVEY INDICATES INCREASED USAGE

According to a recent survey by the Restfoam Division of Hewitt-Robins Inc., 370 Lexington Avenue, New York, N. Y., a 350% increase in the showings of foam rubber furniture was observed at the American Furniture Mart's recent show in Chicago, Ill. Foam rubber is moving into all types of furniture, from period to advanced modern, as fast as the foam manufacturers can supply it, the survey reports.

Ninety-eight furniture and 10 mattress manufacturers exhibited foam products this year over a last year's count of 28 furniture and 6 mattress producers, and, in addition, many manufacturers already using foam have added new pieces to their lines, reveals the survey, which covered foam rubber produced by the entire industry. Majority of the manufacturers showing foam furniture report that demand of furniture dealers for foam-cushioned or padded furniture is taking up all the production they can get from the constantly expanding foam rubber industry.

Lower Priced Styles

A significant note of the market, according to Hewitt Restfoam, is the appearance of the material for the first time in quantity in medium and lower priced lines of furniture and in contemporary styles. "The extent and variety of foam padded furniture in evidence at the Show," Hewitt sales officials observed, "indicate this year will be the greatest the foam industry has ever seen." Foam padding was strong in modern lines last year, but it appeared in comparatively few contemporary lines and in almost no period or traditional furniture.

Nearly all the upholstered furniture exhibits display at least one foam piece this market. Many contemporary lines show increases of 25 to 100 percent in foam this market over last year, and a number are offering foam as optional upholstery in all their furniture. Upholstered rocking chairs, considered as the most popular type of chair with estimated sales running into hundreds of thousands yearly, appear for the first time this year with foam cushions in a number of lines.

Foam Requests Doubled

One contemporary chair and sofa manufacturer says demand for foam furniture from his plant has doubled in the past six months; another reports "lots more requests for foam than I've ever seen before"; a third has seen his order for foam cushions grow in the past six months from dozen lots every two months to over two hundred a month; and a fourth, who puts foam cushions on vanity benches and dining room chair seats, claims foam padding helps sell both the retailer and the consumer.

A large producer of period reproductions and formal pieces is featuring foam cushions for the first time in Chippendale and Sheraton sofas, claiming that foam reproduces more faithfully the hair pads in the original models. Modern furniture manufacturers have always favored foam and this market finds one of the major houses showing nothing but foam, and another introduced 50 new pieces, all padded with foam, and planning eventually to replace all conventional stuffing materials with rubber.

Among the newest uses of foam in modern lines are as padding under a leather covered coffee table and as a sectional hassock which unfolds into a series of attached cushions that turn a long coffee table into a bench or that form a low seat against a wall.

Size of Dunlop

According to a recent talk by T. Willshaw, chief rubber engineer of the company, the Dunlop Rubber Co., Ltd., has 24 factories in England, with a manufacturing area of some 10,000,000 square feet. In addition, the company operates factories in 10 other countries. If all the factories in England alone were grouped together in one site, they would require electricity, water and coal equal to that consumed by a fairly large city with a population of about 300,000.

Goodrich Chemical Appointments

Three new appointments in the sales organization of the B. F. Goodrich Chemical Co., Cleveland 15, Ohio, were recently announced. George B. Koch, advertising and sales promotion manager, has been appointed staff representative for chemical sales to direct the promotion of agricultural chemicals. F. L. McNabb has been appointed staff representative for Hycar and rubber chemicals. M. W. Osborne, Jr., has been named to succeed Mr. Koch as advertising and sales promotion manager. Mr. Koch joined the company in 1946 after four years service in the U. S. Army during the war. He is a graduate of Western Reserve University. Mr. Osborne is a graduate of Illinois College with a B. S. degree in chemistry and holds a master's degree from the Harvard Graduate School of Business Administration. He joined the company in 1947. Mr. McNabb has been with Goodrich since 1935. He goes to Cleveland from the Industrial Products Sales Division of the parent company in Akron. A graduate of Kenyon College, he holds a master's degree in organic chemistry from Ohio State University.

English Latex Foam Plant

Cheshire Latex Ltd., Honeywell Mill, Honeywell, Oldham, England, has been organized for the manufacture of latex foamed mattresses and cushions. The new firm employs approximately 250 persons and plans to produce about 1,000 mattresses a week. William A. Macmillan and Douglas Ward are the operators of the new plant. They also operate the Futura Rubber Co., Ltd., Meadowside Mills, Stalybridge, Cheshire, Eng., where they employ between 600 and 700 workers in the manufacture of children's and women's booties.

ORR ADDRESSES ONTARIO GROUP ON ENGINEERING WITH RUBBER

The January 10 meeting of the Ontario Rubber Section of the Chemical Institute of Canada, held at the University of Toronto, Toronto, Ont., Canada, was addressed by Marcus O. Orr, technical superintendent of the Sundries Division of the B. F. Goodrich Co., Akron, Ohio. Mr. Orr spoke on "Engineering With Rubber."

Mr. Orr observed that man-made rubbers, while relatively new materials, have broadened the scope of usefulness of rubber and are today providing an additional imposing array of engineering tools. New uses for rubber and plastics of all types have greatly extended the horizons of the rubber and plastics industries which are already highly diversified, he said.

The speaker described some of the latest commercial applications for rubbers in new applications and services and discussed the outlook of new discoveries and new materials expected to stem from research and development in Canada and the United States.

Elect Southern Ohio Officers

The Southern Ohio Rubber Group has announced the results of the annual balloting held for the election of officers. The new officers for the 1950 season are: *Chairman,* Robert B. Sucher (Inland Manufacturing); *Treasurer,* Theodore C. Argue (Inland Manufacturing); *Secretary,* Russell J. Hoskin (Inland Manufacturing). Louis J. Keyes (Dayton Rubber) has been named chairman-elect for 1951. Herbert Karch (C. P. Hall), Joseph Rockoff (Dayton Rubber), and John M. Walsh (Xylos Rubber) have been elected to the board of directors for three-year terms. Robert S. Radow (Dayton Rubber), Jack E. Feldman (Inland Manufacturing), and George E. Lang (Premier Rubber) are holdover directors for a two-year period. Hold-over directors for a one-year period are Roy H. Marston (Binney & Smith), Albert J. Marshall (Naugatuck Chemical), and Homer R. Gill (Goodyear-St. Marys).

Washington Group Hears Cole

The January 6 meeting of the Washington Rubber Group held at the Cosmos Club in Washington, D. C., was addressed by Dr. Otis D. Cole, assistant director of the chemical and physical research laboratories of the Firestone Tire & Rubber Co., Akron. Dr. Cole presented "A Discussion of the Service Characteristics, Compounding, and Physical Properties of Some of the Newer Synthetic Rubbers." He discussed recent work on the structure, properties and service characteristics of low temperature polymers compared with those of natural rubber and GR-S. It was stated that the rapid loss of physical properties shown by natural rubber stocks during oxidation is accompanied by a loss of crystallinity of the stock as indicated by preliminary X-ray and stress relaxation data. Further work along this line will be published at a later date, he said.

Named Special Representative

Howard R. Erwin

Howard R. Erwin, former technical superintendent of the Goodyear Synthetic Rubber Corp. plant at Torrance, Calif., has been named special representative of the Chemical Division of the Goodyear Tire & Rubber Co. Mr. Erwin has been assigned to the Cleveland, Ohio, district. A graduate of Iowa State College, Mr. Erwin is a member of the American Chemical Society, the American Institute of Chemical Engineers and is affiliated with the Buffalo, Akron and Los Angeles Rubber Groups.

Acquires Technical Coatings, Inc.

The formulas, processes, procedures, engineering blueprints, and manuals of Technical Coatings, Inc., of Pasadena, Calif., have been purchased by the Coast Paint and Chemical Co. of Los Angeles. Coast Paint has also employed all key personnel of Technical Coatings who have been working in the tank sealing field. In the acquisition, Walter W. Smith and L. C. Boller, both formerly with Technical Coatings, become chairman of the board and vice-president and chief chemist, respectively, of the Coast Paint organization, while D. M. MacGregor remains as vice-president. In conjunction with the acquisition of Technical Coatings, Inc., Coast Paint is establishing an extensive engineering, research and development laboratory to specialize in the solution of problems of tank design and sealing for business and industry.

Porter Acquires Quaker Rubber

Acquisition of the Quaker Rubber Corp., Philadelphia, Penna., manufacturers of industrial rubber goods since 1885, has been announced by the H. K. Porter Co., Pittsburgh 22, Penna. All of the stock of Quaker was acquired for an undisclosed cash consideration from the two former owners, R. P. Bremer and W. P. Cline, who will remain with the company to manage the business for the new owners. The acquisition was made by Porter to further diversify the company's activities, and it is planned to further expand the business of Quaker. Additional branch warehouses will be opened shortly in Pittsburgh, Atlanta, Ga., and Tulsa, Okla.

Champion Glove Corp. Formed

Louis K. Braunston, active in the rubber and plastics business for the past 20 years, has announced the formation of the Champion Glove Corp. with factory and executive offices located at 850 Metropolitan Ave., Brooklyn, N. Y. The new firm, of which Mr. Braunston is president, will manufacture plastic coated industrial work gloves. The company's patented formulation process, known as "Champlex," a high, abrasive-resistant plastic, produces a rubber-like coating on cotton and canvas gloves that is said to be impervious to most acids, oils, solvents and industrial chemicals. Two trade-marked brands, "Moldex Gloves" and "Champlex Gloves," will be marketed to the industrial and household trades. A special department has also been set up to coat wire, metal parts, cord, belting, tools, etc., with the Champlex process. The other officers of the new concern are Arthur A. Mayers, vice-president and general sales manager and Henry R. Seidman, secretary and assistant sales manager. Morton B. Harley is factory superintendent in charge of production.

U. S. Testing Elects Esselen

United States Testing Co., Inc., Hoboken, N. J., has elected Gustavus J. Esselen as vice-president. Dr. Esselen will continue in active direction of the Esselen Research Division of U. S. Testing, recently created by the merger of the Esselen Research Corp., Boston 16, Mass., and U. S. Testing. Dr. Esselen has been active in applying chemistry to industry for the past twenty-nine years. During the war he was consultant to the Baruch-Conant-Compton Rubber Survey Committee. Later he was chairman of the Tropical Deterioration Administrative Committee. This was a joint committee of the Army and Navy with the National Defense Research Committee (NDRC), in charge of coordinating all work relating to the prevention of deterioration of material in the tropics. He was also a member of the Chemical Referee Board of the Office of Production Research and Development.

Rucoam Announces Expansion

William Merton, president of the Rubber Corporation of America, Brooklyn 6, N. Y., has announced that 1949 production of the Rucoam Plastics Division ran well ahead of 1948. During the second half of 1949, Mr. Merton said, plants were operating three shifts a day at full capacity. He noted that the gains were made in both light and heavy gauge plastic film with a decided emphasis on prints. To keep ahead of the increasing demand the company is expanding its Hicksville, Long Island, plant. The newest available equipment is now being installed at Hicksville and should be in operation by early spring. This equipment will increase the output of Rucoam plastic by at least 50%. It is planned to confine the production at the redesigned Hicksville plant to the lighter gauges, from .003 to .008 gauge film, and to run the heavier gauges at the Brooklyn plant.

Goeckel Joins Rhee Elastic

Edward C. Goeckel

Edward C. Goeckel, associated with the Wilson Sporting Goods Co. for the past 35 years, has joined the Rhee Elastic Thread Corp., Warren, R. I. Following an extensive baseball playing and umpiring career, Mr. Goeckel joined the Gut and String Department of Wilson. He was later transferred to the baseball factory, and eventually became superintendent of the golf ball factory, a position he held for 14 years. Most recently, he served as a special sales representative.

NBS Develops Synthetic Mica

Synthetic mica, with essentially the same properties as natural mica, but able to withstand much higher temperatures, has been crystallized successfully by scientists at the National Bureau of Standards, Washington, D. C. This work is part of a broad program of fundamental research on fluorine-type artificial minerals carried on at the Bureau under the sponsorship of the Office of Naval Research. The synthetic mica phase of the program has been carried out in cooperation with the U. S. Bureau of Mines and the Colorado School of Mines. Successful control of crystal orientation in the growth of synthetic mica would mean that machine methods could be used for large-scale domestic production of sheet mica. In this way mica synthesis could make the United States self-sufficient in high grade mica insulating materials.

Wood Block Flooring Adhesive

Pioneer Latex & Chemical Co., Middlesex, N. J., has announced the development of a rubber base adhesive designed especially for laying wood block flooring on surfaces which are heated by radiant heat. This product is the result of a four-year development program aimed at obtaining a wood block mastic which would give a strong, flexible bond under varying humidity conditions, and yet would not flow at temperatures up to 200°F. The material is applied by saw-tooth trowel, into which material the wood block may be imbedded immediately. The design of the product is such that it permits the wood block to adjust itself in the mastic under varying conditions.

LOS ANGELES NEWS

Because of the interest aroused by the successful presentation of the first course in Basic Rubber Technology, which is now nearing its conclusion, the Board of Directors of the Los Angeles Rubber Group, Inc., has arranged to repeat the course for the benefit of those who were unable to attend the first classes and for other members of the Rubber Group who would like to take advantage of the type of instruction so effectively presented.

The class will be given for fifteen Monday evenings from 7:00 to 10:00 P.M., starting February 20, in the laboratory of H. M. Royal, Inc., 4814 Loma Vista Avenue, Vernon. It will be conducted by the same instructors as for the first course, R. B. Stringfield, President of Fullerton Manufacturing Company, and F. W. Woerner, Chief Chemist of the L. A. Standard Rubber Company, both of whom have had many years experience in the industry and in teaching.

The subject matter will be the same as for the first course, including elements of compounding, vulcanization, physical testing, milling, calendering, extrusion, presses, hydraulic systems, mold design and cost estimating, and will be accompanied by some student laboratory work. No specific previous educational background is necessary to qualify for enrollment.

Due to space limitations, enrollment will be restricted to twenty-two and confined to members of TLARGI. Cost to the student will be $15.00 for the course, the balance of the expense being covered by TLARGI. Further details may be secured from Dickson Sheppard of the Goodyear Tire & Rubber Co., Box 3339, Terminal Annex, Los Angeles 54, Calif.

A meeting of the 1950 officers, directors and committeemen of the Los Angeles Rubber Group was held at the Hotel Mayfair on January 10. Two new committees were organized, an Educational Committee to work out a satisfactory educational program for those interested in the rubber business, and a Special Advisory Committee, consisting of past chairmen, to make suggestions and constructive criticism for the improvement of the organization.

The 1950 committees of the Group are headed as follows: *Auditing*, Roy N. Phelan; *Current Events*, Bert E. Biheller; *Golf*, R. L. Bowen; *Membership*, Fred Thistle; *Prize*, Bernard del Guerra; *Reception*, Tway Andrews; *Photography*, A. R. Hromatka; *Technical*, Dickson Sheppard; *Year Book*, Charles Kuhn; *Educational*, Phil Drew; *Placement*, Al Pickard; *Advisory*, C. R. Wolter.

At the recent Christmas Meeting of the Los Angeles Rubber Group, a Lord Elgin wrist watch was presented to A. R. Hromatka, official photographer of the Group. The watch was appropriately inscribed.

Reynolds Discusses Cold Rubber

The development of cold rubber promises to bring to the American public 50,000-mile truck tires, 75,000-mile passenger tires, longer-wearing foam rubber, and a host of other improved rubber products, according to a talk made by Dr. W. B. Reynolds of the Phillips Petroleum Co. The talk was part of a symposium on recent developments in chemical science and technology sponsored by the New York Section of the American Chemical Society in New York City on January 21. Pointing out that although cold rubber was first made commercially less than two years ago. Dr. Reynolds stated that it had reached an annual output rate of more than 150,000 long tons by the end of 1949.

Goodyear Plant in Luxembourg

Goodyear Tire & Rubber Co., Akron, Ohio, is planning to open a new plant in Luxembourg in the near future. It has been learned that Randolph B. West, Jr., associated with Goodyear's Foreign Operations Department, plans to leave for Luxembourg in the near future in order to establish a complete personnel department at the new plant. Until recently, Mr. West was assistant to F. J. Carter, Goodyear personnel director.

Ed Wilson of Golden State Rubber Mills has left California to join the staff of the parent company, the Radiator Specialty Co., in Charlotte, N. C., as rubber production manager. The Los Angeles plant of Golden State has been sold, but the name of the new owner has not yet been announced.

The meeting of the Los Angeles Rubber Group on February 7th was to be sponsored by the Firestone Tire & Rubber Co. Arnold C. Sorenson, Chief Scout Executive of the Los Angeles Council Area, was scheduled to give a talk on "But He's My Son." The Technical Group, which meets earlier in the day, was scheduled to hear a talk on "Compounding Rubber for Electrical Properties" by A. R. Kemp.

The Los Angeles Rubber Group has announced that F. C. "Cam" Johnston, of the Caram Manufacturing Co., has been appointed a member of the board of directors to succeed A. J. Hawkins, Jr., of DuPont, who has been transferred to the Chicago area. The Group has also organized an Unemployment Committee to assist unemployed members. The committee is comprised of Ed Royal (H. M. Royal) and Al Pickard (Braun Corp.).

William "Bill" Moser, formerly associated with the Kirkhill Rubber Co. as factory manager, is now with the Pacific Rubber Co. at Oakland, Calif.

CANADIAN NEWS

Employees of the New Toronto, Ont., plant of the Goodyear Tire & Rubber Co. of Canada were recently granted a seven-cent-an-hour increase, retroactive to January 1. Some 1600 workers are involved. Besides boosting the average rate to $1.41 an hour, the contract also reduces from 20 to 15 number of years of service required in order to secure three weeks vacation, and increased from seven to eight the number of paid statutory holidays. The union orginally had sought a wage increase of 25-cents-an-hour and a pension plan providing for $100 a month.

The advancement of synthetic rubber in Canada was the topic of a recent talk given by Dr. J. S. Tapp, of the Polymer Corporation, before the Wellington-Waterloo Section of the Chemical Institute of Canada. According to Dr. Tapp, chemical rubber will fight it out on a competitive basis of price, quality and adaptability with natural rubber. Discussing the over-all consumption picture, he pointed out that world requirements for rubber have doubled in each succeeding decade since 1900. The speaker also stressed the fact that since the end of the recent war the Polymer plant at Sarnia has continued operations at full capacity.

Edward Barringham, president, Barringham Rubber & Plastics, Limited, has announced the appointment of Chester A. Emerson as vice-president and general manager of the company.

Mr. Emerson is a native of Stow, Maine, and a graduate of the public schools of Medford, Mass., and Dartmouth College. He joins the organization with a comprehensive background in the rubber and plastics industry, including extended service with the United States Rubber Company, Converse Rubber Company and Cia U. S. Royal del Pacifico, S. A.

During the war, Mr. Emerson held important assignments in the U. S. Rubber Company's program of munition manufacture for the U. S. Government at Des Moines, Iowa, and Milwaukee, Wisc. He came to his new assignment from New York City, where he was assistant director of manufacturing of the U. S. Rubber Export Company.

The recent death of Leonard Leathes McMurray at his home in Toronto, Ont., at the age of 83 has been reported. Mr. McMurray, a lifelong resident of Toronto, was associated with Gutta Percha and Rubber, Ltd., for over 50 years, retiring in 1945. He was graduated from Trinity College and joined the staff of the Imperial Bank of Canada. Shortly thereafter he became associated with Gutta Percha.

Cabot Carbon Laboratory Head

Harry Collyer

Harry Collyer, formerly in charge of the rubber and plastics testing and technical service at the Boston Research and Development Department of Godfrey L. Cabot, Inc., Boston, Mass., has been appointed laboratory director of Cabot Carbon, Ltd., Ellesmere Port, England, effective April 1, 1950. This new Cabot furnace black plant, the first to be built in England under ECA, will produce 20,000,000 pounds of carbon black annually from oils and other liquid raw materials. Mr. Collyer will be concerned with the maintenance of quality control of the plant by means of laboratory tests, and will also be in charge of sales technical service. Graduated from Tufts College in 1937, Mr. Collyer received his B. S. degree in chemical engineering from the School of Engineering. After graduation, he joined the staff of the Colgate-Palmolive-Peet Co., working first in the production department and then in their research and development laboratory. In 1942, he became research assistant in the division of industrial cooperation at the Massachusetts Institute of Technology. Here, he worked particularly with the development of synthetic rubbers and reclaiming processes. In January, 1946, he came to the Boston Cabot Research and Development Department.

Methanol Plant in Operation

A new methanol production unit began operation during the last week of December at the Texas City, Texas, plant of Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation. Methanol is important as an intermediate, especially as a source of formaldehyde, as a general purpose solvent, and for use in methanol-base anti-freezes. The addition of these facilities is part of the company's long-range expansion program. The new unit more than doubles the combined methanol production of the company's Niagara Falls, New York, and South Charleston, W. Virginia, plants.

Settle N. J. Zinc Strike

The strike at the Palmerton, Penna., plant of the New Jersey Zinc Co., which started last September, was terminated on January 25 when the union ratified by a 947 to 24 vote an agreement reached between its negotiating committee and company authorities. The agreement incorporates in the contract the company's present pension plan with modifications to provide for a minimum pension of $100 per month, including social security, for men 65 years old with 25 years' service. Because of the length of the strike, supplies of zinc oxide were running dangerously low, with the Josephtown, Penna., plant of the St. Joseph Lead Co. carrying the major supply burden. When the coal shortage in the Pittsburgh area indicated an early shutdown of the Josephtown plant many telegrams were dispatched to Washington by rubber manufacturers. Settlement of the N. J. Zinc strike is expected to relieve the situation shortly.

New Naval Stores Product

Maleo-pimaric acid, a new naval stores product developed by the Department of Agriculture, is reported to have possibilities for use in the preparation of plasticizers, resins and emulsifying agents. The development has now reached a stage where commercial testing is feasible and where samples for tests are available on request to prospective users. The soap of the ethyl maleo-pimaric acid has already been evaluated on a pilot-plant scale as an emulsifier in the preparation of synthetic rubber. The rubber produced is said to compare favorably with standard GR-S-10. Further details and samples of maleo-pimaric acid can be secured from the Naval Stores Research Division, Southern Regional Research Laboratory, Bureau of Agricultural and Industrial Chemistry, 2100 Robert E. Lee Boulevard, New Orleans 19, La.

Latex-Lube Hard Water Corrections

Excellent results through the use of Sprex AC and Supreme water hardness suppressants have been reported by the DuBois Co., Cincinnati, Ohio. Small quantities of the suppressants are said to have proved extremely effective in conditioning hard water used in spray or dip systems with Latex-Lube and Liqui-Lube. The use of only a few hundredths of a percent of these suppressants is said to extend the life of the dip solution and prevent scum formation of stock inclusions in hardest water. In view of the small amounts of Sprex AC or Supreme needed, the DuBois Company is planning to package these chemicals in convenient small units. Delivered prices on Latex-Lube and Liqui-Lube, the company's major products for the rubber industry, were recently reduced to the lowest figures ever quoted.

Zinzalian Named Sales Manager

George Zinzalian

E. F. Drew & Co., New York 10, N. Y., has announced the appointment of Dr. George Zinzalian as sales manager of the Technical Products Division. Dr. Zinzalian has been connected with the Drew organization for over 16 years, serving in important capacities including supervision of production, product development and research at the Boonton, N. J., plant. Dr. Zinzalian will direct the sales and service activities of the Technical Products Division and Textile and Leather Oils Departments. He will maintain headquarters at the general offices of the Drew company at 15 East 26th St., New York 10, N. Y.

Shifts Operating Facilities

Golden State Rubber Mills and the Latex Seamless Products Co., operating in Los Angeles, Calif., for the past 17 years, have discontinued their operations in that area and begun the operation of a new plant at 1700 Dowd Road, Charlotte, N. C., under the name of the parent company, Radiator Specialty Co. New and specially designed equipment has been installed in the Charlotte plant to provide better and more efficient service. Correspondence intended for either Golden State Rubber Mills or the Latex Seamless Products Co., should now be addressed to the Radiator Specialty Co., P. O. Box 1109, Charlotte, N. C. C. E. Wilson continues as general manager of rubber operations.

G-E Silicone Release Agent

The Chemical Department of the General Electric Co., Pittsfield, Mass., has announced the development of a new silicone emulsion for use as a mold release agent in the rubber industry. The new emulsion, G-E 81161, is said to have exceptional hard water stability, remaining stable 24 hours at 750 ppm in ½% dilution. The material will not break or cream under repeated recycling in centrifugal pumping systems. G-E 81161 will not stain light colored stocks. It is suitable for mold spray or bag dip, is rust-inhibited and has low toxicity.

OBITUARIES

William F. Pfeiffer

William F. Pfeiffer, formerly president and general manager of the Miller Rubber Co., Akron, Ohio, now a division of the B. F. Goodrich Co., died of a heart ailment on January 22 in City Hospital in Akron. He was 76 years old. Mr. Pfeiffer was president of Miller when that company was one of the "big four" of the industry. It was absorbed by Goodrich nearly a quarter-century ago. Mr. Pfeiffer was born on March 17, 1873, in Wadsworth, Ohio, where he attended school. He joined the Miller company in 1906, then a small concern. He watched the company grow from a small shop to one of the leading rubber companies. In addition to his duties with Miller, he was also a director of the Rubber Association of America, the Consumers' Rubber & Supply Co., and the old First Trust and Savings Bank of Akron, when he retired six years ago. He was also president of the Straitsville Brick Co. of New Straitsville, Ohio, and vice-president of the Logan Clay Products Co., Logan, Ohio. Services were held on January 24 at his home in Akron, with interment in Glendale Cemetery. He leaves his wife.

Lothair S. Kohnstamm

Lothair S. Kohnstamm, president of H. Kohnstamm & Co., Inc., New York, N. Y., died on January 29 at his home of a heart ailment. He was 69 years old. Born in Brooklyn, N. Y., Mr. Kohnstamm attended the College of the City of New York and Columbia University where he was graduated from the School of Mines in 1902. During the first World War, he served in the Chemical Warfare Service of the U. S. Army. Mr. Kohnstamm joined the Kohnstamm company 48 years ago, and in 1932 became president. A founder of the North Shore Country Club and a member of the Chemists and Columbia Clubs, he was also treasurer of the Home for Aged and Infirm Hebrews and New York treasurer of the National Jewish Hospital in Denver, Colo. Two sons and a daughter survive.

Arthur N. Hood

Arthur N. Hood, one of the founders of the Hood Rubber Co., Watertown, Mass., now a division of the B. F. Goodrich Co., died on January 31, at his home in Newton, Mass. He was 81 years old. Born in Chelsea, Mass., Mr. Hood studied chemistry for two years at the University of Berlin, then entered the employ of the Franklin Rubber Co. of Boston, Mass. In 1896, with his brother, the late Frederick C. Hood, he founded the company bearing their name. He retired in 1915. Mr. Hood was a director of the United Elastic Corp. and for many years was a director of the Young Travelers Aid Society, becoming president in 1923. His daughter survives.

Charles R. Mastin

Charles R. Mastin, chairman of the board of the La Favorite Rubber Manufacturing Co., of Hawthorne, N. J., died in the Paterson (N. J.) General Hospital on January 31 at the age of 72. He had been ill for many years. Mr. Mastin was born in Midland Park, N. J., on January 17, 1878. He was associated with La Favorite Rubber for 49 years. The company was founded by his father, Charles I. E. Mastin. Mr. Mastin obtained his elementary education in Paterson, attended Hackensack High School and matriculated at the Mount Herman School in Massachusetts. He entered the family business in 1901, rising rapidly in various posts until he became chairman of the board. Mr. Mastin was a member of the Abraham Godwin Chapter of the Sons of the American Revolution. His wife, son and two daughters survive.

James P. Dunphy

James P. Dunphy, eastern pigment sales manager for the New Jersey Zinc Sales Co., died on January 3 at his home in Brooklyn, N. Y., after an illness of several months. He was 61 years old. For the past 32 years he was connected with New Jersey Zinc, serving successively as chief clerk, sales representative and eastern pigment sales manager. Previously, Mr. Dunphy had been employed for eight years by the Consolidated Edison Co. of New York, where he was manager of the Cashier's Department. He is survived by his wife, two sons and a daughter.

John B. Venturini

John B. Venturini, sales representative for the Cameron Machine Co. of Brooklyn, N. Y., died at his home in Dumont, N. J., on February 4 at the age of 66. Associated with Cameron Machine since 1914, Mr. Venturini acted as company sales representative in Canada and New England for over 30 years. Since 1946 he had been at the main office in Brooklyn, handling special sales in the metropolitan and New Jersey areas. His widow and daughter survive.

Clarence J. Corning

Clarence J. Corning, retired president of the Corning Rubber Co., Brooklyn, N. Y., died on January 5, at his home in New York City. He was 77 years old. More than 40 years ago he founded the Corning Rubber Co. based on his inventions in rubber appliances used in dentistry. He retired two years ago. Funeral services were held on January 6 at the Walter B. His widow and son survive.

J. Russell Parker

J. Russell Parker, chairman of the board and former president of Parker, Stearns & Co., Brooklyn, N. Y., died on January 12 at his home in Forest Hills, L. I., N. Y. He was born and educated in Brooklyn, and in his youth went to work for the rubber firm established by his father, the late Russell Parker. Mr. Parker was a Mason. For many years until his recent retirement, he had been a trustee of the East New York Savings Bank. His wife survives.

DuPont Alamask Deodorants

E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del., has entered the industrial aromatics field with the introduction of a series of rubber deodorants under the trade name "Alamask." Odorants are available for natural and synthetic rubber including DuPont's neoprene. They may be employed singly or in combination, and concentrations from one-tenth to one-hundredth of one percent, added during the manufacturing process, are said to be sufficient. A year's formalized research at the DuPont Aromatics Laboratory at New Brunswick, N. J., supplemented by a testing program in the rubber laboratory, went into the development of the rubber deodorants.

SPE Elects Officers for 1950

Plastics engineers who attended the 1950 Technical Conference of the Society of Plastics Engineers, held on January 11, 12, and 13 at the Hotel Carter in Cleveland, Ohio, elected new officers to represent the national society during 1950. The new officers are: *President,* C. Todd Clark of the F. Burkart Manufacturing Co., St. Louis, Mo.; *Vice-President,* Islyn Thomas of the Thomas Manufacturing Corp., Newark, N. J.; *Secretary,* Robert L. Davis of the Continental Can Co., Cambridge, Ohio; *Treasurer,* W. O. Bracken of the Hercules Powder Co., Cleveland, Ohio.

Open New Pallet Factory

American Pallet Corporation has announced the opening of a new plant at Cobleskill, N. Y. According to the company, it has developed a new method of cutting down cost of maintenance by using its pre-cut, pre-drilled, air-dried pallet repair hardwood. The repair lumber is stocked and distributed from the company's factory and warehouse in Hoboken, N. J. The new method is said to enable the company to offer substantial savings to the customer.

Forms Paul Blum Company

Paul Blum, formerly manager of the chemical and plastics department of Alan D. Oppenheimer, Inc., has organized the Paul Blum Co., with plant and offices at 315 Larkin St., Buffalo 10, N. Y. The new company will deal in industrial chemicals and by-products.

THE STORY BEHIND THE WORD...

KIBITZER...

In Germany, there is a "yappy" little bird called the kibitz. One day as the famous chess player, Dr. Ziff, was engrossed in a serious game, an annoying onlooker questioned his moves. The testy old Doctor turned and said, "Go away you kibitz." From this incident comes our word "kibitzer" which describes a person like the one who annoyed Dr. Ziff.

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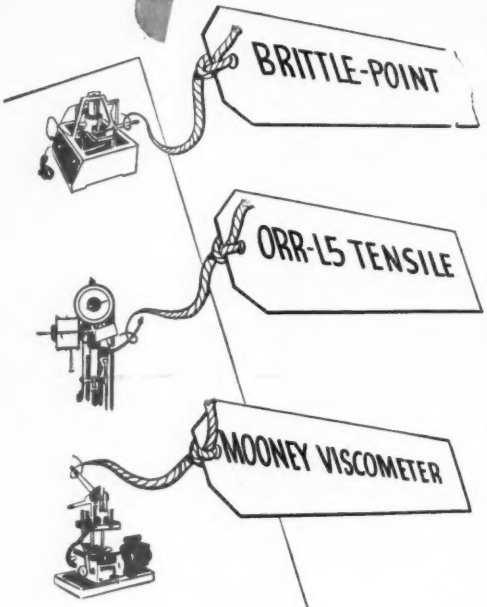

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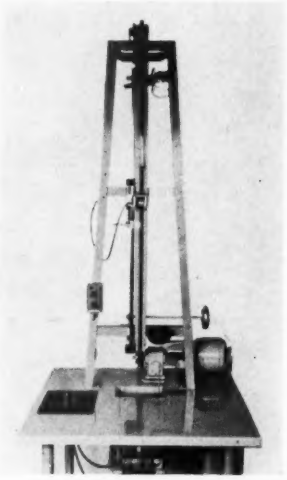
Standard of the World

NEW EQUIPMENT

GFB-NBS Rubber Strain Tester

Developed and constructed by G. F. Bush Associates, Hopewell, N. J., in close cooperation with the National Bureau of Standards, the GFB-NBS Strain Tester for Rubber and Rubberlike Compounds measures the percent elongation of a virtually motionless specimen at a definite time after the application of a pre-chosen stress, psi. This stress is obtained by loading the specimen friction-free in proportion to its thickness in millimeters.

In application, the unit will predict cure time to give any desired percent elongation, and will provide precise measurements of extension set for a specified stress since



specimens can be stressed for a uniform time interval. The automatic property of this tester is said to reduce human error to a minimum. A timer accurately controls all components of an operation cycle. Safety guards are provided for all of the various electrical and mechanical components.

The unit is 34 inches wide, 32 inches deep, and 96 inches high. It weighs 300 pounds, and operates on 115 volt AC single phase 60 cycles. It measures to about 1000% elongation in 1% increments. It induces stresses from 50 to 400 psi within 1% accuracy. By using additional fixed weights, stresses to 5000 psi may be obtained.

The complete unit, ready to plug in, consists of a thickness gage, which measures .0001-inch increments; a die, which cuts seven specimens .254 inches plus or minus .001 inches in width; a benchmarker, which marks 10 cm. plus or minus .004 inches, and a strain tester with 28 weights plus or minus .0002 lbs., as well as other minor accessories.

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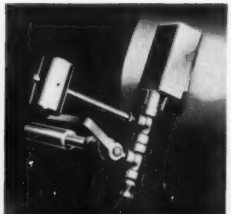
Employing only one pen arm and one measuring circuit, this spectacularly speedy yet simple electronic instrument gives up to 6 different temperature records in 6 different colors on a single round chart! Every 6 seconds, it records a new measurement — so fast that records appear as continuous lines. There's nothing like it! Get all the facts on this money-saving, precision-built instrument. Send for Bulletin 427-1. The Foxboro Company, 256 Neponset Ave., Foxboro, Mass., U.S.A.

TYPICAL APPLICATIONS IN RUBBER PROCESSING

Calender and Mill Roll Temperatures (unique Foxboro Roll Surface Measuring Head shown at right); Polymerizers; Banbury Mixers; Condensate and Stock; Steam, etc. Any such measurements all recorded on one chart.



†Exclusive of temperature bulbs.

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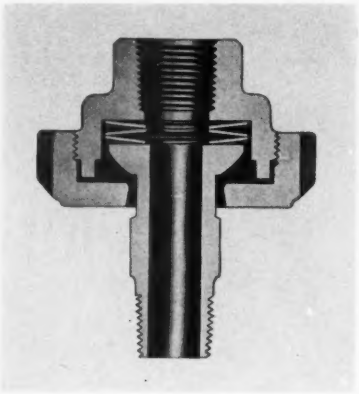
FOXBORO Instrumentation

INDICATING · RECORDING · CONTROLLING

Barco Rotary Swivel Joint

A rotary swivel pipe joint for swivel and slow revolving applications has been developed by the Barco Manufacturing Co., 1801 West Winnemac Avenue, Chicago 40, Ill. The design of the joint eliminates wedge action of the ball against the gasket, and thus turning torque



is almost completely eliminated. The ball is held in place by a Belleville spring. According to the manufacturer, it is unique among swivel and revolving joints in that a small amount of side flexibility reduces the possibility of wear or breakage from side strain. The joint performs without leakage at extreme temperatures. Successful performance has been obtained at continuous rotation up to 30 rpm. It will handle practically all fluids and gases including corrosive acids and alkalis. The joint is presently available in 90° angle and straight designs in ⅜ to 1-inch pipe sizes.

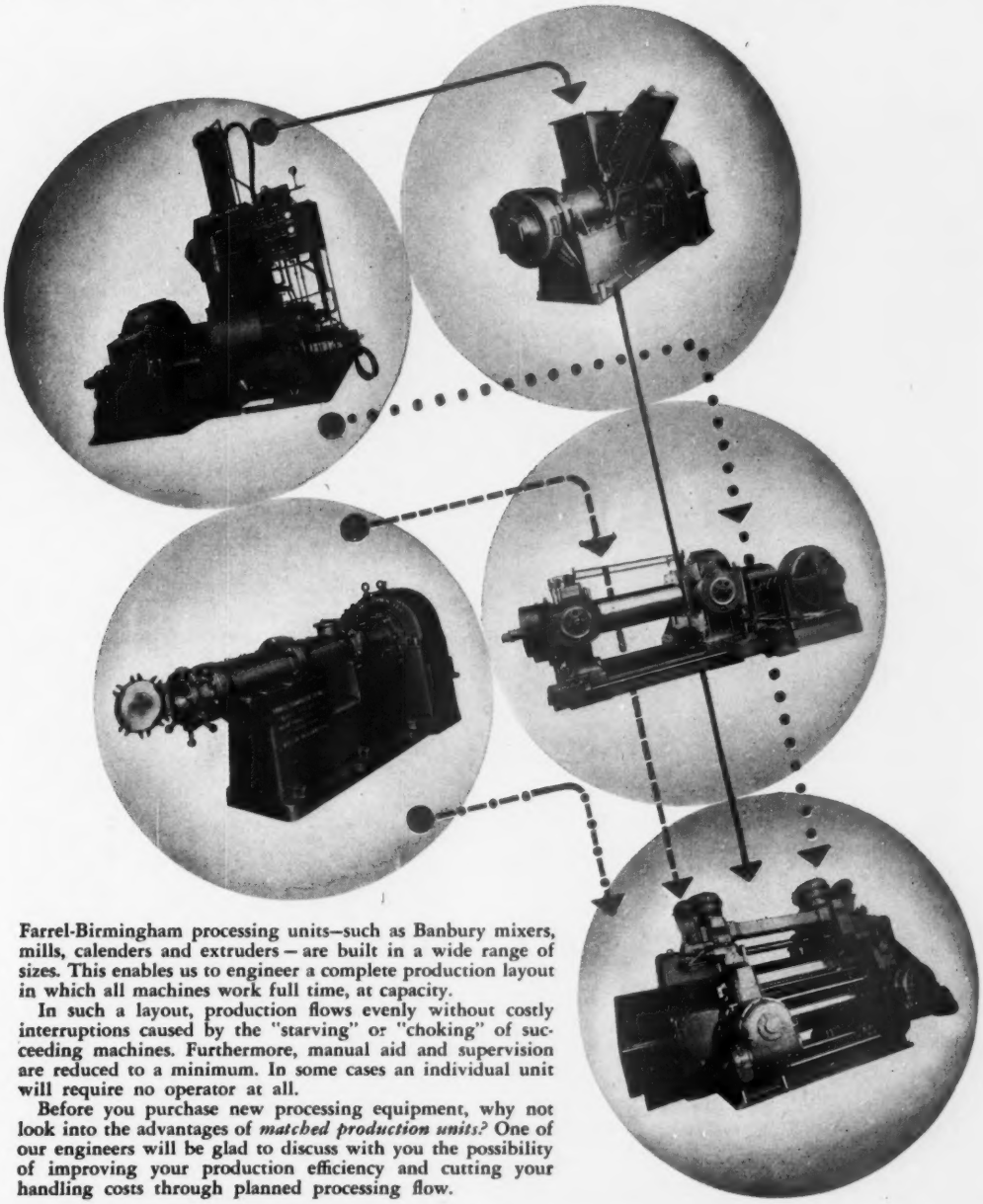
Portable Insulation Tester

Breakdown voltages can be accurately determined with a minimum of damage due to burning with a new portable Insulation Tester manufactured by Radio Frequency Laboratories, Inc., Boonton, N. J. The unit provides complete facilities for taking insulation resistance and dielectric absorption measurements on cables, transformers, rotating machinery, condensers, etc. Designed for preventive maintenance field testing and general purpose production and laboratory use, the RFL Model 184C has four voltage ranges providing continuously variable d.c. voltages up to 10 K.V. A constant voltage performance regulates the voltage within one-half of one percent. Full manual control is provided for selecting any output voltage up to the maximum.

Resistances ranging from 0.1 to 50,000 megohms may be read directly on a megohmeter scale at open circuit voltages of 0.5, 1, 5, and 10 K.V., or may be simply calculated in ranges from 0.3 to 20,000 megohms from the readings of a voltmeter and microammeter connected to read resistance at any desired test voltage operating from zero volts to 10 K.V. The alternate methods are selected on one switch. Leakage current ranges are 30, 150, 300 and 1,500 microamperes. A shield terminal pro-

These Units Can All Be

MATCHED IN CAPACITY FOR FREE-FLOWING PRODUCTION



Farrel-Birmingham processing units—such as Banbury mixers, mills, calenders and extruders—are built in a wide range of sizes. This enables us to engineer a complete production layout in which all machines work full time, at capacity.

In such a layout, production flows evenly without costly interruptions caused by the "starving" or "choking" of succeeding machines. Furthermore, manual aid and supervision are reduced to a minimum. In some cases an individual unit will require no operator at all.

Before you purchase new processing equipment, why not look into the advantages of *matched production units?* One of our engineers will be glad to discuss with you the possibility of improving your production efficiency and cutting your handling costs through planned processing flow.

FARREL-BIRMINGHAM COMPANY, INC. • ANSONIA, CONN.

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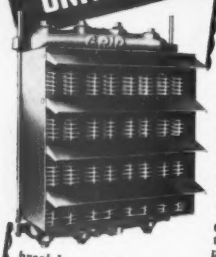
SIT DOWN-NOW....

WITH YOUR MAINTENANCE MAN — AND FIND OUT JUST WHAT YOUR UNIT HEATING SYSTEM IS COSTING YOU!

- In down time due to inefficient operation of your unit heating system.
- In higher fuel cost due to heating that portion of your plant *not* in the working zone.
- In repairs to the units due to leaks, breakdowns or heating failures, caused by corrosion.
- In failure of units due to their not being capable of standing high steam pressure.

These are just a few of the items of expense you may find if you are operating unit heaters of other design and construction than GRID. Avoid this needless expense.

INVESTIGATE.... GRID CAST IRON CONSTRUCTION UNIT HEATERS



GRID Unit Heaters are designed and made to eliminate maintenance while at the same time saving fuel cost, because they provide heat where it is most needed — to the working zone. They eliminate stratification of warm air at ceiling level . . . GRID Unit Heaters are designed for low outlet temperatures and more air delivery to the floor line—not the ceiling. Don't be confused by unit heaters with great BTU delivery and high outlet temperatures. BTU in a unit heater does not mean everything . . . it's the CFM and low outlet temperature that really counts.

GRID heating sections are ONE piece construction high test cast iron—the metal for permanency . . . . no electrolysis to cause corrosion, breakdown, leaks, heating failures, because there are no dissimilar metals used in GRID construction . . . . no maintenance expense—but years of trouble-free heating service. . . . will withstand steam pressures up to 250 lbs. Write for complete catalog, CUR-RA150, capacity tables and engineering data.

D. J. MURRAY MANUFACTURING CO.

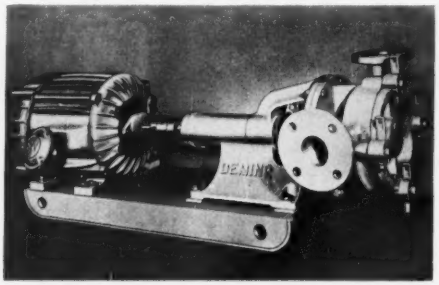
WAUSAU WISCONSIN

vides a guard circuit which by-passes the meter, avoiding false readings. For polarization checks, a polarity reversing switch allows switching either the positive or negative side of the voltage supply to the high voltage terminal. The tester operates from a 115 volt 60 cycle line and consumes a maximum of 65 watts.

Safety features include a relay for automatic removal of dangerous capacitance charges remaining on cables or condensers after test. The microammeter is protected against overload by a neon lamp that also indicates breakdown of the test specimen. Over-voltage from careless control of the variac is prevented by limiting resistors.

Deming Centrifugal Latex Pump

Designed especially for pumping creamed or centrifuged latex, Centrifugal Latex Pumps manufactured by the Deming Co., Salem, Ohio, can also be adapted for pumping other types of liquids. The pump is of the centrifugal type and is built for continuous operation. Fully

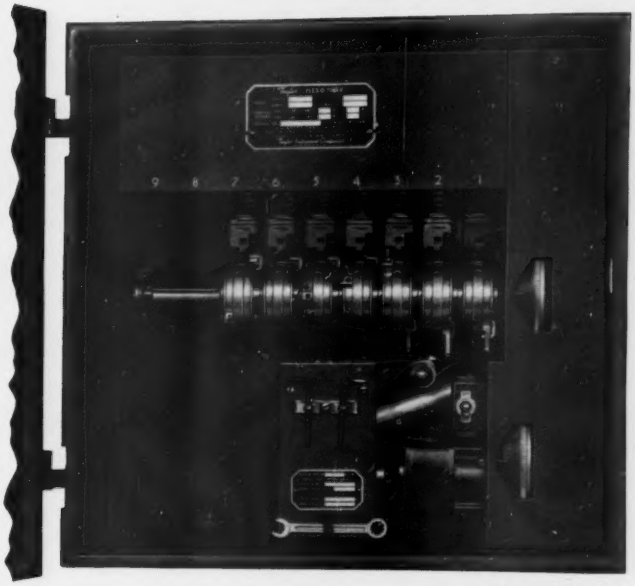


open type impeller is mounted on the tapered end of the shaft and can be easily removed. A water cooled stuffing box and packing arrangement prevents coagulation around the shaft. The casing cover can be removed from the fluid end in a matter of seconds so that the interior of the pump can be cleaned easily and quickly. This can be done without disturbing either suction or discharge piping. The suction inlet is at the stuffing box side of the pump which eliminates the pressure against the stuffing box. The pump is made with 2-inch discharge and 2½-inch suction with flanged connections. Two and five horsepower models are available with capacities from 60 to 100 G.P.M.

4 NEW ADVANTAGES IN FLEX-O-TIMER*

Time Cycle Controllers

ONE OF 5 STANDARD TAYLOR MODELS RE-DESIGNED FOR GREATER ADAPTABILITY



YES, we've completely re-designed the famous Taylor Flex-O-Timers. Result—a whole new family of Taylor Time Cycle Controllers precision built to meet your strictest processing requirements! For instance, you get these four big advantages:

***1.* Greater Flexibility.** Wide range of cycle bands from 14 seconds to 540 minutes available to meet all time cycle controller requirements. Cycle duration may be either fixed or varied. Up to 18 control functions may be contained in one instrument.

***2.* Newly Designed, Segmented Drum.** Individual aluminum segments mounted on a central shaft. One segment for each control function. Provision for number of actuating pins needed to operate a function as many as 15 times. Readily interchangeable cycle drum assemblies enable you to preset cycles for applications where components within cycle vary periodically.

***3.* Unit Parts Easier to Reach.** Universal dust-tight case has hinged door with bayonet-action latch. All unit assemblies front-mounted—easy to reach when you open door. Thus, terminal strips, air valves and switches, snap-operators, cycle drum, solenoid motor and gear train can be easily removed for repair or replacement. Terminals, control functions and gears are all plainly numbered so that connections or gear train changes can be made in the field.

***4.* Easier and Simpler Adjustments.** Actuating pins of precision die-cast aluminum are easy to remove and set. Fingertip adjustment of speed dial gives a range of adjustments of 80 to 1.

Of course, the Flex-O-Timer shown here is just one of the family!

(1) It controls a group of as many as 9 pneumatic or 9 electrical functions (or any combination of each)—with all the intermediate steps within a function automatically controlled for the duration of the manufacturing operation. Particularly adaptable for such applications as *tire presses or horizontal and vertical vulcanizers.*

* Registered Trade-Mark

Meet the other members, too!

(2) The 10 to 18 function Flex-O-Timer for complex control according to a predetermined schedule and over a specifically timed period. Perfect for such applications as *horizontal and vertical vulcanizers.*

(3) The 1 to 5 function Flex-O-Timer for simpler applications like *belt presses, mechanical rubber products presses* or *tire presses.*

(4) The 1 to 3 function Flex-O-Timer—specifically developed for *tube molding* presses.

(5) The single function Flex-O-Timer . . . particularly useful for *condensate removal* applications.

• • •

Write today for the new Taylor Catalog 98154. It tells the whole new and improved Flex-O-Timer story. Just one more way we're ready to help you keep quality up and costs down with Taylor Accuracy. Taylor Instrument Companies, Rochester, New York, and Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.*

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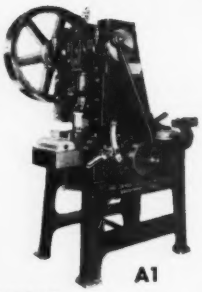
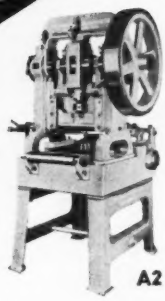
For MORE than Half a Century the name COULTER has meant MORE in higher quality cuttings . . . MORE IN GREATER PRODUCTION. So much MORE that . . .


A1

Men who Know PRODUCTION MACHINES Choose

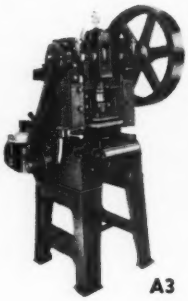
the James COULTER Machine Co.
BRIDGEPORT, CONN.

MODEL A-1
Cutting Heels at high speed production or short runs.


A2

MODEL A-2
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-3
Cutting Multiple Heels and Taps with or across stock grain.

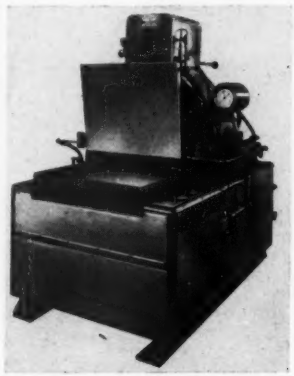

A3

MODEL A-2s
(Not illustrated)
Cutting across grain of stock.

COULTER PRODUCTION MACHINES SINCE 1896

Stereotex Matrix Molding Press

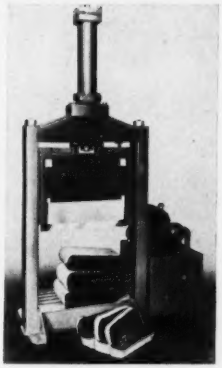
Developed for use in the production of rubber printing plates, plastic printing plates, Vinylite electrotype molds and stereotype matrices, the Stereotex Direct Pressure Matrix Molding Press manufactured by Birdsboro Steel Foundry & Machine Co., Birdsboro, Penna.,



and distributed by Stereotex Machinery Co., Stamford, Conn., is offered in 350, 900 and 1200 ton sizes. The press provides for both cold and hot operation and assures absolute platen parallelism. The one-piece cylinder and frame, top platen moving platen and table brackets are special "Birdsboro" steel castings. The ram is a close grained iron alloy casting. The sliding plates are made of a special high-carbon steel, flattened and ground. Other advantages claimed for the press include a self-contained and fully automatic hydraulic system, and steam-electric heating. Platen size for the 1200-ton and the 900-ton models is 26 by 31½ inches. The 350-ton press has a platen size of 25 by 29 inches.

...tough...
SEE PAGE 488

CRUDE RUBBER BALE CUTTER



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•

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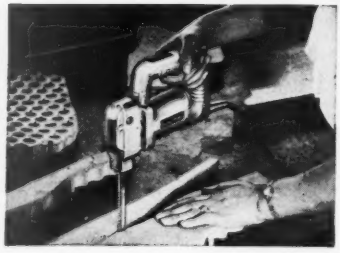
New STANLEY *No. 99* SPONGE OR FOAM RUBBER CUTTER

. . . cuts up to 4" thick at speeds up to 30 ft. a minute!



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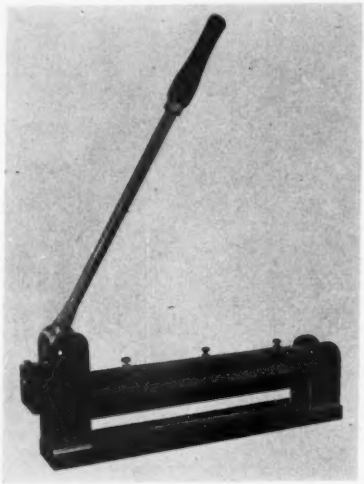
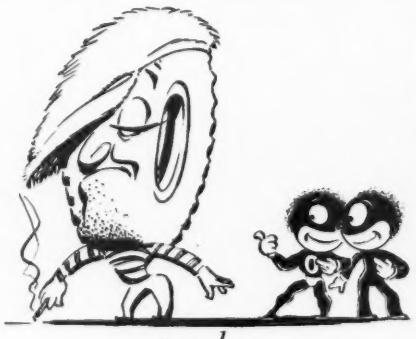
Bench space of only 3 by 24 inches is required for the Smaco Cantilever Hand Cutter manufactured by the Sivon Machine & Manufacturing Co., Painesville, Ohio. This cutter is principally used for cutting rubber gasket stock as it is removed on pans from the curing cylinders



to the cutting table. The blade of the cutter is double beveled, and makes a straight sided cut on irregular shapes preparing them for the splicer. When the blade is in the up position, clearance of 1-inch is provided. Clearance between the posts is 13 inches. The Smaco cutter will cut thin sheets of rubber or paper, 98% pure gum rubber, rubber in 1-inch thicknesses as well as printers mats. The base of the machine is of wood or composition, with 4 sides. The blade is of high-speed silver steel, ⅛-inch thick, 1½-inches wide, 15-inches long, with a ½-inch double bevel.



. . . tough . . .

SEE PAGE 488

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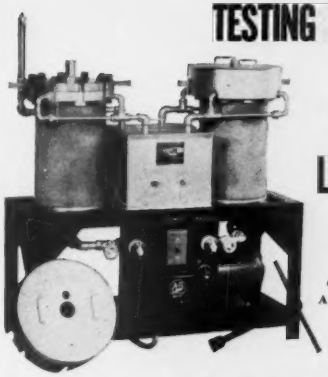
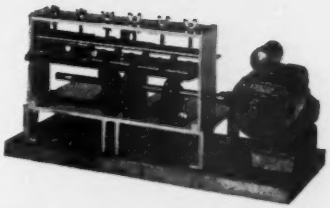
TESTING APPARATUS for the RUBBER LABORATORY



COMBINATION BIERER-DAVIS OXYGEN AGING AND AIR HEAT TEST OUTFIT



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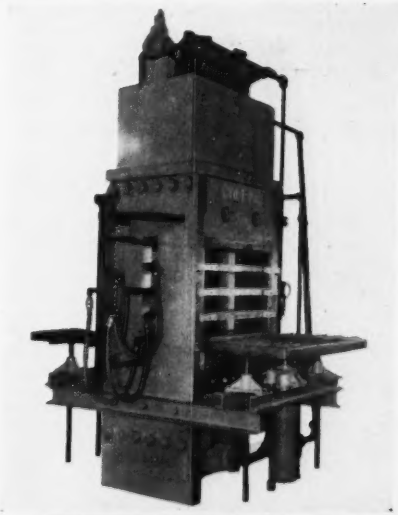

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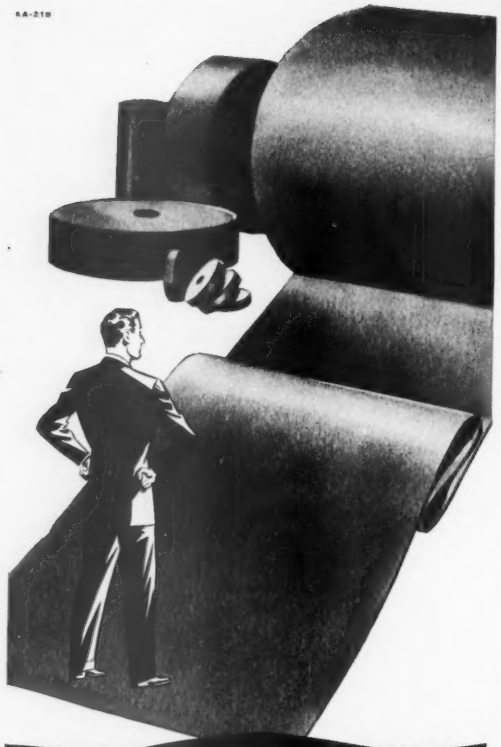
AA-218



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REVIEWS

BOOKS

Organic Reactions. Vol. V. Edited by Roger Adams. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 6 x 9 in. 446 pp. $6.00.

The current volume continues the plan of compiling critical discussions of the more important synthetic reactions which are utilized by almost every investigator assigned to a specific research program in organic chemistry. Each chapter in these volumes is devoted to a single reaction, or a definite phase of a reaction, of wide applicability. As in the previous editions, all of the various authors have had experience with the processes surveyed, and the subjects are presented from the preparative viewpoint, with particular attention paid to limitations, interfering influences, effects of structure, and the selection of experimental techniques. Reactions covered in the present volume include the synthesis of acetylenes, cyanoethylation, the Diels-Alder reaction, the Leuckhart reaction, selenium dioxide oxidation, the Hoesch synthesis, and several others. There are 10 chapters in all and a subject index.

•

Rayon: The First Man-Made Fiber. By Joseph Leeming. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. 5½ x 8½ in. 204 pp. $5.75.

Written in semi-technical language so that it can be understood by laymen as well as by students and textile technologists, this book tells the story of the research that led to the discovery of rayon, and the development work that resulted in rayon becoming a successful commercial product. It describes the various methods by which rayon is made, the manner in which the uses of rayon have broadened, and the influence of this fiber on fabrics previously made only with natural fibers. There are 15 chapters, a bibliography, and a fairly extensive glossary of rayon fabrics and terms used in the textile industry.

BOOKLETS, CATALOGS, etc.

Packaging and Paper Lacquers Based on Nitrocellulose. Hercules Powder Co., Wilmington, Del. 8½ x 11 in. 32 pp.

A description of the formulations and materials used in recent research on nitrocellulose packaging and paper lacquers, and detailed results of the investigations, are presented in this booklet. Paper-coating properties investigated and reported on include flexibility, grease resistance, scuff resistance, color stability, and specular gloss. In each instance, the effect of the resin and plasticizer on these properties is described. Sections on heat-sealing coatings are also included in the booklet as well as suggested starting formulations for paper-coating lacquers. An explanation of testing methods and description of lacquer components, solvent, paper-coating method, and coating cycle used in the research are cited. Sixteen charts and graphs illustrate and supplement the text.

•

Picco Solvents and Solvent Oils. Pennsylvania Industrial Chemical Corp., Clairton, Penna. 8½ x 11 in. 6 pp.

This brochure describes the characteristics and gives typical analyses of Picco aromatic petroleum naphthas, coal tar naphthas, heavy naphthas, coal tar heavy naphthas, solvent oils and heavy solvent oils, and cites the most common applications of each. Useful related information is also included, such as evaporation rates and their meanings, solvent power analysis such as the Kauri-Butanol and analine point methods, solvent handling, explosive mixtures of solvents and physiological actions of solvents.

Vinylite Resins and Plastics. Bakelite Corp., Unit of Union Carbide and Carbon Corp., 300 Madison Avenue, New York 17, N. Y. 8½ x 11 in. 44 pp.

This booklet has been prepared as an informative guide to Vinylite resins and plastics, the forms in which they are available, their important properties, and up-to-date listings of their more important applications. Data on the use of the resins in flexible and cast film, coated paper, molding and extrusion compounds, floor coverings, cloth coatings, surface compounds, adhesives, wire and cable insulation and in other applications is included. Property tables for the resins in their various forms are also included. Handsome color photographs illustrate the booket.

•

Flammables: Self-Checking Chart. (File No. 1331). Protectoseal Co., 1920 S. Western Avenue, Chicago 8, Ill. 8½ x 11 in. 12 pp.

This bulletin outlines procedures to be followed in helping industry reduce the hazard of and loss by fire. The subject of flammable liquids is covered in sections entitled "Fire Facts," "Production Line," "Science Stops Fires," and "Inspection Service." In the back of the booklet is a pocket containing seven departmental charts which enable anyone to make a quick and accurate check-up on flammable hazards.

•

Roll Slitters and Unwinders. (Bulletin No. 549). Johnstone Engineering & Machine Co., Parkesburg, Penna. 8½ x 11 in. 4 pp.

Construction details, specifications and uses of the roll slitters and winders manufactured by the company are offered in this illustrated folder. Some of the units featured include the synchronized winder, slitting and roll winding machine, aluminum foil separator, uniform tension winder, and a newsprint splicer. Various slitting units, including a score cut slitter, are described with their accessory units.

•

Tri-Clad High Speed Synchronous Generators. (GEA-5415). General Electric Co., Schenectady 5, N. Y. 8½ x 11 in. 8 pp.

This bulletin deals with generators for standby, portable, and prime source power in wide-spread fields of application. Profusely illustrated, it gives three typical installation stories, describes Tri-Clad protection, and tells about construction features, mechanical modifications and performance data. Ratings from 12½ kva to 1250 kva, and speeds from 1800 rpm to 514 rpm, are covered.

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FEinc Continuous Filtration. (Bulletin No. 103). Filtration Engineers, Inc., 155 Oraton St., Newark 4, N. J. 8½ x 11 in. 24 pp.

Principles of continuous rotary vacuum filtration are outlined in this bulletin. Technical details of the FEinc Rotary Vacuum Filter with the FEinc String Discharge are presented together with an explanation of the manner in which this filter speeds the continuous processes of many industries. Included in the bulletin are a large cutaway view of the FEinc string discharge filter, details of the FEinc automatic valve, general construction specifications, and typical installation diagrams. Also described is the FEinc Pilot Plant Filter, and Feon synthetic filter cloths made to fit all types of filters.

•

How Salaried Employees Benefit from Job Evaluation. By R. M. Schmitz. National Foremen's Institute, Inc., New London, Conn. 5½ x 8¼ in. 32 pp. 50c per copy.

In four brief, clearly understood chapters, the author has put forth what job evaluation will and will not do for the employee. In addition, he gives the steps for setting up the program and covers every individual who falls within its scope. Lastly, he outlines the major benefits to be derived from the system. Various cartoon drawings enliven the text material.

•

How to be Human on the Job. By Wallace G. Strathern. National Foremen's Institute, Inc., New London, Conn. 5½ x 8¼ in. 56 pp. 50c per copy.

For more than 20 years the author has been instructing industrial personnel on the importance of and method for attaining good human relations. In this booklet, he presents nine basic points for attaining favorable relationships between the supervisor and the worker. The reader is not only shown what to do, but how to do it. The booklet is illustrated with cartoons and drawings.

•

Trading on the Commodity Exchange in New York. Commodity Exchange, Inc., 81 Broad St., New York 4, N. Y. 36 pp.

The mechanics of trade on the New York Commodity Exchange are considered in this interesting booklet. Such matters as the "futures" market and "hedging" are discussed. Some of the commodities sold on the floor of the exchange, including rubber, are discussed as to source of supply, quantities, method of packing, grading, etc. The booklet is illustrated with photographs depicting the physical layout of the exchange, and with pictures of the exchange in operation.

•

Masterplate Iron-Clad Concrete Floor. Master Builders Co., 7016 Euclid Ave., Cleveland 3, Ohio. 8½ x 11 in. 36 pp.

Specific advantages of the company's "Iron-Clad" concrete flooring material are emphasized in this booklet. This material consists of tough, ductile, specially processed, size-graded iron particles, combined with an exclusive cement dispersing agent. Field experience and laboratory tests discussed in the booket indicate that the company's flooring outwears plain concrete floors by five to one. Directions for laying the material are included.

•

Parallel Shaft Sleeve Bearing Speed Reducers. (Engineering Bulletin 1110). Falk Corp., Milwaukee, Wisc. 8½ x 11 in.

Designed to provide complete engineering data on Falk parallel shaft units with sleeve bearings, this handbook offers the information necessary in choosing the proper reduction gear for a given purpose. Horsepower rating tables and torque capacity charts supplement assembly and dimensional data. Construction features are outlined in cut-a-way views, photographs and engineering drawings.

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MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

Natural Rubber

A steady upward climb has marked the price of spot rubber on the Commodity Exchange since our last report (January 5). The low for the period was 18.00 cents reached on January 17, while the high was 19.50 cents reached on February 7, a rise of 150 points. The average price of spot rubber for the month of January was 18.33 cents based on 21 trading days. In the previous month the average price for spot rubber was 17.53 cents.

In terms of British currency, rubber prices reached the highest level in the last 28 years during this past period. The supply of spot rubber currently is tight and the price advance is attributed by brokers to the demand from both British and Americans. The supply situation is expected to ease in the near future.

The Singapore market was also strong and this contributed to the higher trend. Additional factors behind the upward rubber price movements were reports that Russia would be a further heavy buyer of rubber in the Far East. It was reported last week that Russian buyers during January took about 18,000 tons of Malayan rubber.

Expectations of early purchases of rubber by the Economic Cooperation Administration also came in for consideration. It was stated in rubber trade circles that consumers are anxious to build up their inventory positions in view of the disturbed political situation in Indo-China and Java.

Today's quotations on the market, London and Singapore, follow:

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.19½
March	.19⅜
April	.19
Thin Latex Crepe:	
Spot	.24
March	.23¾
Thin Brown Crepe, No. 2	.18⅝
Ambers, No. 3	.18⅜
Flat Bark Crepe	.17½

London Market

(Standard Smoked Sheets)

March	18.30 — 18.45
April-June	18.08 — 18.16

Singapore Market

(Standard Smoked Sheets)

March	17.10 — 17.14

Synthetic Rubber

(Dry Types-Per Pound)

Butaprene NF	.440 - .450
Butaprene NL	.450 - .460
Butaprene NAA	.490 - .500
Butaprene NXM	.520 - .530
Chemigum 30 N4NS	.400 - .470
Chemigum 50N4NS	.400 - .470
Chemigum N3	.450 - .520
GR-I	—— - .185
GR-S	—— - .185
Hycar OR-25	.450 - .460
Hycar OR-15	.520 - .530
Hycar OS-10	.500 - .510
Neoprene Types CG and AC	—— - .500
Neoprene Type E	—— - .650
Neoprene Types FR and KNR	—— - .750
Neoprene Type GN	—— - .320
Neoprene Type GN-A	—— - .320
Neoprene Type RT	—— - .350
Neoprene Type S	—— - .320
Neoprene Type W	—— - .350
Paracril 18	.430 - .450
Paracril 26	.440 - .460
Paracril 35	.510 - .530
Silastic (compounded)	2.35 - 4.40
Thiokol Type A	.370 - .470
Thiokol Type FA	.520 - .620
Thiokol PR-1	.750 - .850
Thiokol Type ST	.750 - .850

NEW YORK, FEB. 7, 1950

Scrap Rubber

During the month of January scrap rubber moved at a fairly steady pace continuing an improvement in market conditions which has been evidenced during the past few months. Optimistic estimates for business in the first quarter of 1950 have thus far been substantiated. Prices for scrap rubber have not been adjusted during this past period. Current quotations follow:

Mixed passenger tires	ton	$13.00
Beadless truck tires	ton	nom.
Mixed truck tires	ton	15.00
Beadless passenger tires	ton	nom.
No. 1 passenger peelings	ton	42.50
No. 1 truck peelings	ton	42.50
Red passenger tubes	lb.	.07
Black passenger tubes	lb.	.04
Mixed passenger tubes	lb.	.04
No. 2 truck tubes	lb.	nom.
Red truck tubes	lb.	.07
Black truck tubes	lb.	.03¾
Buffings	ton	15.00

Reclaimed Rubber

Consumption of reclaim for the month of December is estimated at 18,247 long tons by the Department of Commerce. This compares with a consumption of 18,512 long tons for the previous month. The demand for reclaim during the first part of this year has not been quite as brisk as expected. Business, however, has been good and a let-up in demand is not anticipated. The increased prices of low-grade natural crudes may result in many users of natural reverting to reclaim. Prices remain at the same levels. Current quotations follow:

Tires

Black, Digester (Natural)	lb.	.08¼ - .08¾
Peels No. 1	lb.	.08¼ - .08¾
Whole Tire (Blend)	lb.	.08¼ - .08¾

Inner Tubes

Black (Natural)	lb.	.11½ - .12
Red (Natural)	lb.	.13½ - .14½
Butyl	lb.	.08¼ - .08¾

Shoe

Unwashed (Natural)	lb.	.08¾ - .09¼

Cotton Tire Fabrics

While the tire fabric market maintains a generally low level, demand for cotton tire fabrics has shown a small rise. The demand for chafers has also experienced a slight upward turn. According to trade sources the demand for extra staple peelers has been extremely low with no appreciable improvement in sight. Prices have not been adjusted during this past period. Current quotations follow:

Standard, Peeler, 12/4/2	lb.	.68
Standard, Peeler, 14/4/2	lb.	.70
Standard, Peeler, 16/4/3	lb.	.7250
Extra Staple, Peeler, 12/4/2	lb.	.8315
Extra Staple, Peeler, 14/4/2	lb.	.8575
Extra Staple, Peeler, 16/4/3	lb.	.8825

Chafers

14.4 oz. (per sq. yard)	lb.	.67
9.25 oz. (per sq. yard)	lb.	.6325
11.65 oz. (per sq. yard)	lb.	.60
8.9 oz. (per sq. yard)	lb.	.6475

Cotton

The price of middling uplands on the Cotton Exchange has swung in a range of 75 points since our last report (January 5), high for the period being 32.39 cents reached on February 7, and low being 31.64 cents reached on January 6. The average price of middling uplands for January was 31.89 cents based on 25 trading days. This compares with an average of 31.08 cents for the preceding month.

According to ECA officials, Western Europe will increase production of synthetic fibers to the maximum by 1952-53, concluding year of the Marshall Plan, but will still have to import $420,000,000 of raw cotton. During the fiscal year ending July, 1950, Western Europe's imports of raw cotton from the dollar area will show an increase of 57% over the fiscal year ended July, 1949.

Trade sources declare that pressure is being brought on the Commodity Credit Corporation to add 16 months' carrying charges to the selling price of Government-owned cotton, above the 105% of the current loan level. Previously, it had been expected that only 6 or 7 months of carrying charges would be added. It was also reported that the 1950 loan will be based on the July 15th parity.

World cotton production is now estimated by the Office of Foreign Agricultural Relations at 30,850,000 bales of 500 pounds gross. The present world estimate represents an increase of 6% over last year's revised figure of 29,155,000 bales but is still below the 5-year prewar average by nearly 3%.

Quotations for middling uplands on the Exchange follow:

	Jan. 5	February 7		
	Close	High	Low	Close
March	30.88	31.46	31.36	31.46
May	30.81	31.49	31.40	31.49
July	30.34	30.95	30.83	30.94

Closing Rubber Prices on New York Commodity Exchange

(No. 1 R.S.S. Contract)

FROM JANUARY 6 TO FEBRUARY 7

Jan.	Spot	Mar.	May	July	Sept.	Sales
6	18.50	18.36	18.05	17.60	17.50	68
7	——	——	——	——	——	——
8	——	——	——	——	——	——
9	18.42	18.36	18.05	17.60	17.50	135
10	18.50	18.38	18.03	17.60	17.50	30
11	18.50	18.36	18.08	17.60	17.50	121
12	18.50	18.22	17.93	17.40	17.30	61
13	18.25	18.09	17.80	17.30	17.20	181
14	——	——	——	——	——	——
15	——	——	——	——	——	——
16	18.12	17.97	17.72	17.30	17.15	49
17	18.00	18.15	18.00	17.38	17.20	124
18	18.18	18.10	17.80	17.25	17.15	80
19	18.18	17.92	17.70	17.20	17.10	122
20	18.06	17.95	17.65	17.35	17.20	29
21	——	——	——	——	——	——
22	——	——	——	——	——	——
23	18.06	18.20	17.98	17.60	17.30	45
24	18.38	18.27	17.96	17.55	17.33	35
25	18.38	18.22	17.90	17.49	17.36	36
26	18.38	18.35	18.00	17.56	17.35	24
27	18.38	18.45	18.07	17.65	17.50	97
28	——	——	——	——	——	——
29	——	——	——	——	——	——
30	18.54	18.90	18.43	18.00	17.90	219
31	18.88	18.95	18.44	17.95	17.70	149
Feb.						
1	18.88	19.20	18.58	18.20	17.95	320
2	19.12	19.10	18.56	18.12	17.90	53
3	19.12	19.30	18.75	18.30	17.98	94
4	——	——	——	——	——	——
5	——	——	——	——	——	——
6	19.25	19.48	18.78	18.25	18.00	64
7	19.50	19.38	18.87	18.35	18.07	102

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Meticulous workmanship has been a tradition at Brockton Cutting Die for three generations. That's why rubber manufacturers turn to us for quality dies of all kinds . . . for dies that really retain their cutting edge. Our experience and facilities enable us to turn out a cutting die for every type of service.

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Graduated .001", range 1.000", Throat depth 2 1/16".

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IN these days of rapidly changing developments owners of Royle extruding machines are in the advantageous position of being able to adapt their extruders to either rubber or plastics production. If you are faced with the problem of extruding rubber and plastics the versatility of ROYLE extruders is of paramount importance to you. Whether you require a light or heavy production extruder features have been incorporated to assure maximum results. The change-over is quickly and simply accomplished.

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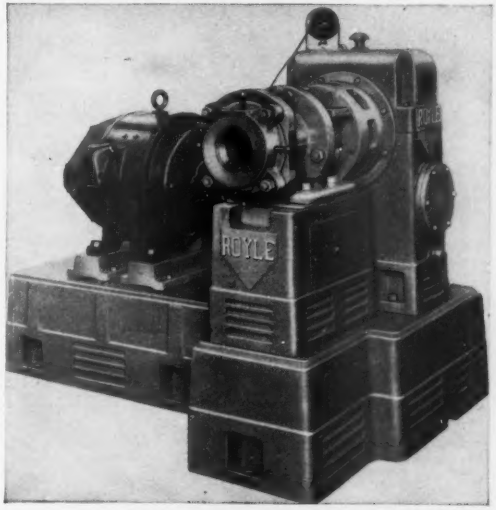

ROYLE # 2 Extruding Machine. Non-extended cylinder, plain tubing head.

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

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PATERSON 3, NEW JERSEY

CURRENT MARKET PRICES

Of Rubber Chemicals and Compounding Ingredients

FEBRUARY 7, 1950

Prices are, in general, f.o.b. works. Range of prices indicates grade or quantity variations.

Abbreviations: bbls., barrels; c.l., carlot; cyl., cylinder; dlvd., delivered; dms., drums; l.c.l., less than carlot; M.B., masterbatch; min., minimum; ref., refined; sap., saponified; sp., special; syn., synthetic; t.c., tank cars.

[a] East of Mississippi.

—The arrangement of this section follows closely the Chemical Section of the 1949 RUBBER RED BOOK to which readers are referred to determine the classification of any material or brand name.

—Although suppliers of every material were contacted for price information, only those materials are listed for which quotations have been furnished us. The quotations are not guaranteed and prospective purchasers should contact suppliers for confirmation before placing orders. Suppliers are requested to send us regularly current prices on all of their materials used in the rubber industry.

—All requests for information or listings should be sent to Market Editor, RUBBER AGE, 250 West 57th St., New York 19, N. Y.

ACCELERATORS

A-1 (Thiocarbanilide)	lb.	.34	.39
A-32	lb.	.59	.69
A-77	lb.	.42	.55
A-100	lb.	.42	.55
Accelerator No. 8	lb.	—	.90
Accelerator—49	lb.	.44	.45
Accelerator—89	lb.	—	1.20
Accelerator—122	lb.	—	1.30
Accelerator—552	lb.	—	1.80
Accelerator—808	lb.	.59	.61
Accelerator—833	lb.	1.13	1.15
Acro AC-165	lb.	.37	.39
Altax	lb.	.35	.37
Arazate	lb.	—	2.16
Beutene	lb.	.59	.61
Bismate	lb.	—	3.00
B-J-F	lb.	.27	.29
Butasan	lb.	—	1.00
Butazate	lb.	—	1.00
Butyl Eight	lb.	1.00	1.25
Captax	lb.	.27	.29
C-P-B	lb.	—	1.95
Cumate	lb.	—	1.45
Dibenzo G-M-F	lb.	—	2.50
Diorthotolyguanidine	lb.	.48	.50
Diphenylguanidine	lb.	.39	.40
El-Sixty	lb.	.39	.46
Ethasan	lb.	—	1.00
Ethazate	lb.	—	1.00
Ethyl Thiurad	lb.	—	1.00
Ethyl Tuex	lb.	—	1.00
G-M-F	lb.	—	2.50
Good-rite Erie	lb.	.32	.34
Guantal	lb.	.47	.54
Hepteen	lb.	.42	.44
Base	lb.	1.80	1.85
Ledate	lb.	—	1.00
Mercaptobenzothiazole	lb.	.27	.29
Mercaptobenzothiazyl Disulfide	lb.	.35	.37
Mertax	lb.	.37	.44
Methasan	lb.	—	1.00
Methazate	lb.	—	1.00
Monex	lb.	—	1.10
Mono Thiurad	lb.	—	1.10
Morfex	lb.	.53	.55
2-MT	lb.	—	.62
NA-22 (for neoprene)	lb.	—	1.50
Novac	lb.	—	1.40
A-13	lb.	.65	.67
O-X-A-F	lb.	.34	.36
Pentex	lb.	.74	.77
Flour	lb.	.12¼	.12¾
Permalux (for neoprene)	lb.	—	1.85
Phenex	lb.	.40	.45
Pipazate	lb.	—	1.53
Pip-Pip	lb.	—	1.80
R-2 Crystals	lb.	—	1.75
Rotax	lb.	.39	.41
RZ-50	lb.	—	1.00
SA 52	lb.	—	1.10
SA 57	lb.	—	1.00
SA 62	lb.	—	1.00
SA 66	lb.	—	1.45
SA 67	lb.	—	1.00
SA 77	lb.	—	1.00
Safex	lb.	—	1.15
Santocure	lb.	.55	.62
Selazate	lb.	—	1.45
Selenac (Ethyl, Methyl)	lb.	—	1.45
Setsit-5	lb.	.75	1.00
SPDX-GH (tons)	lb.	.64	.69
G-L	lb.	—	.95
Tellurac	lb.	—	1.45
Tepidone	lb.	—	.55
Tetrone	lb.	—	1.25
A	lb.	—	1.85
Thiofide	lb.	.35	.42
Thionex	lb.	—	1.10
Thiotax	lb.	.27	.34
Thiurad	lb.	—	1.10
Thiuram E	lb.	—	1.00
M	lb.	—	1.10
Trimene	lb.	.54	.56
Base	lb.	1.03	1.06
Tuads, Ethyl	lb.	—	1.00
Tuads, Methyl	lb.	—	1.10
Tuex	lb.	—	1.10
Ultex	lb.	1.00	1.05
Unads	lb.	—	1.10
Ureka Base	lb.	.58	.65
Ureka C	lb.	.55	.62
Vitasan Crystals	lb.	.48	.53
Vulcanex	lb.	—	.53
Z-B-X	lb.	—	2.45
Zenite	lb.	.33	.35
A	lb.	.42	.44
B	lb.	.39	.41
Zenite Special	lb.	.34	.36
Zetax (coated)	lb.	.33	.35
(uncoated)	lb.	.34	.36
Zimate, Butyl	lb.	—	1.00
Zimate, Ethyl	lb.	—	1.00
Zimate, Methyl	lb.	—	1.00

ACTIVATORS

Blue Lead, Sublimed (dlvd.)	lb.	.15¾	.16¾
Fish Oil, Hydrogenated, Fatty Acid			
Hydrofol Acid (dlvd.)	lb.	.10½	.14½
Hyfac 430 (dlvd.)	lb.	.13½	.14½
Neo-Fat H.F.O. (dlvd.)	lb.	.14	.15¼
Stearex Beads (dlvd.)	lb.	.09½	.10
Lime, Hydrated			
Arrowhead	ton	—	19.50
Sierra	ton	—	19.50
Litharge			
Eagle (dlvd.)	lb.	—	.1475
FSB (dlvd.)	lb.	—	.1475
Magnesium Oxide, Heavy			
General Magnesite 500	lb.	.05	.06½
600	lb.	.06	.08
Michigan No. 15	lb.	.0550	.0600
Permanente	lb.	.05	.06½
Magnesium Oxide, Light			
Baker's (Neoprene Grade)	lb.	—	.28
General Magnesite (Neoprene Grade)	lb.	—	.31
General Magnesite No. 101	lb.	—	.19
General Magnesite Standard	lb.	—	.22
K & M (Neoprene Grade)	lb.	—	.31
Maglite "M" (l.c.l.)	lb.	—	.31
Marine's (Neoprene Grade (l.c.l.)	lb.	—	.31
Michigan No. 30	lb.	—	.24
No. 40 Extra Light	lb.	—	.31
Witco Extra Light	lb.	.32	.35

ACTIVATORS (Cont'd)

Oleic Acid			
Emersol 210 (dlvd.)	lb.	.11¾	.14
L.C.P. Red Oil	lb.	.11	.14
Red Oil (20-24 Saponified) (dlvd.)	lb.	.10½	.14½
Palm Oil Fatty Acid (c.l.)	lb.	—	.11
Potassium Oleate (drums)	lb.	—	.29½
Red Lead			
Eagle	lb.	—	.1575
No. 2 RM (dlvd.)	lb.	—	.1575
Sodium Laurate (drums)	lb.	—	.19
Sodium Oleate—Powder (drums)	lb.	—	.35
Paste (drums)	lb.	—	.20
Sodium Stearate—Powder (drums)	lb.	—	.35
USP Grade (drums)	lb.	—	.37
Stearic Acid, Single Pressed			
Emersol 110 (dlvd.)	lb.	.13	.14
Stearex B (dlvd.)	lb.	.13	.14
Stearic Acid, Double Pressed			
Alba (dlvd.)	lb.	.14	.17¼
S-2-A (dlvd.)	lb.	.14	.15
S-2-B (dlvd.)	lb.	.12½	.13½
Stearic Acid, Other			
Neo-Fat 1-60 (dlvd.)	lb.	.12¾	.13½
Neo-Fat 1-65 (dlvd.)	lb.	.15	.15¾
Stearite	lb.	.09	.10
White Lead Basic Carbonate	lb.	.14¾	.15½
White Lead Basic Sulfate	lb.	.13¾	.14¾
Zinc Laurate (c.l.)	lb.	—	.29
Laurex	lb.	.28	.29
Zinc Stearate	lb.	.34	.36
Aquazinc	lb.	.20	.35

Unclassified Activators

Actifat (dms.)	lb.	—	.18
Acidex	lb.	.09	.15
Aero Ac 50	lb.	.50	.56
Aktone	lb.	.20	.21
Barak	lb.	—	.60
Curade	lb.	.57	.59
D-B-A	lb.	—	1.95
Delac J	lb.	.55	.57
Dibutylamine (dlvd.)	lb.	.49	.52½
MODX-B	lb.	.20	.25
NA-11	lb.	—	.65
Palmalene (drums)	lb.	—	.15
Polyac	lb.	—	1.60
Ridacto (drums)	lb.	.22	.24
Snodotte (dlvd.)	lb.	.13½	.14½
SOAC (min. 10 dms.)	cwt.	—	8.00
SOAC-KL (min. 10 dms.)	cwt.	—	8.00

ANTI-COAGULANTS

Anhydrous Ammonia (l.c.l.)	lb.	.17	.21
Aqua Ammonia (dms.)	lb.	.031	.035
M.B.M. (l.c.l.)	lb.	—	.35

ANTI-FOAMING AGENTS

Aero Anti Foam H	lb.	—	.12½
Regular	lb.	—	.08½
D.C. Antifoam A	lb.	5.65	6.65

ANTI-OXIDANTS

Agerite Alba	lb.	2.20	2.30
Gel	lb.	.58	.60
Hipar	lb.	.82	.84
H. P.	lb.	.61	.63
Powder	lb.	.46	.48
Resin	lb.	.63	.65
Resin D	lb.	.46	.48
Stalite	lb.	.46	.48
White	lb.	1.40	1.58
Akroflex C	lb.	.61	.63
Aminox	lb.	.46	.48
Antox	lb.	.46	.48
Aranox	lb.	—	3.25
Benzoquinone	lb.	1.50	1.75
Betanox Special	lb.	.68	.70
B-L-E	lb.	.46	.48
Carvacrol	lb.	—	.78
Chlorcarvacrol	lb.	—	2.45
Deenax	lb.	.95	1.05
Eugenol C-95%	lb.	—	1.45
Flectol H	lb.	.46	.53
Flexamine	lb.	.61	.63
Gallic Acid, Tech.	lb.	1.10	1.23
USP or NF	lb.	1.27	1.40
Hydroquinone	lb.	.90	.90
Monomethylparaminophenol Sulfate	lb.	2.40	2.90
Neozone Standard	lb.	—	.75
A	lb.	.48	.50
C	lb.	—	.60
D	lb.	.46	.48

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REG. TRADE MARK

RUBBER STRIP CUTTER

PATENTED

A PORTABLE machine capable of stripping slab rubber up to 1″ thick at the rate of 20,000 feet in 8 hours. Any width desired.

SPECIAL FEATURES

- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
- Has repulsion induction motor which carries any overloads.
- Automatic sharpener device keeps knife keen and sharp.
- Has base with rollers and is very easy to handle.

Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Cuts all grades of rubber including pure gum, sponge, etc. Cuts squarely—no rejects.

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NEW LABORATORY MILL

6″ x 12″ with Anti-Friction Bearings

THE laboratory mill illustrated above was expressly designed as a precision mill for operation at high temperature (650° F).

A self contained lubrication system circulates oil through the roll journal bearings. The use of piston ring type oil seals eliminates oil leaks and the frequent replacement of rubber-based oil seals. Write for specification folder.

Capacity of mill: 2 to 3 pounds
Space required: 28″ wide, 60″ long.

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Our products are engineered to fill every need in natural and synthetic rubber compounding wherever the use of vulcanized oil is indicated.

We point with pride not only to a complete line of solid Brown, White, "Neophax" and "Amberex" grades, but also our aqueous dispersions and hydro-carbon solutions of "Factice" for use in their appropriate compounds.

Continuing research and development in our laboratory and rigid production control has made us the leader in this field.

The services of our laboratory are at your disposal in solving your compounding problems.

THE STAMFORD RUBBER SUPPLY CO.
STAMFORD, CONN.

Makers of Stamford "Factice" Vulcanized Oil Since 1900

ANTI-OXIDANTS (Cont'd)

Oxidex	lb.	—	3.60
Parazone	**lb.**	**—**	**.75**
PDA-10	**lb.**	**.36**	**.38**
PDA-20	**lb.**	**.36**	**.38**
Permalux	lb.	—	1.85
Pyrogallic Acid, Resublimed	**lb.**	**2.60**	**2.65**
USP Crystals	**lb.**	**2.10**	**2.15**
Resorcin, Tech. (dlvd.)	**lb.**	**—**	**.64**
Santoflex B	**lb.**	**.46**	**.53**
BX	lb.	.57	.64
35	lb.	.61	.68
Santovar-A	**lb.**	**1.30**	**1.37**
O	lb.	1.10	1.17
Santowhite Crystals	lb.	1.65	1.72
Santowhite MK	**lb.**	**1.40**	**1.52**
S.C.R. (tons)	**lb.**	**.32**	**.34**
Stabilite	lb.	.46	.48
Alba	lb.	.69	.74
L	lb.	.48	.50
White	lb.	.46	.48
Stabilizer No. 1	lb.	—	1.55
Stabilizer No. 320	lb.	—	.75
Sunolite	lb.	.20	.23
Tannic Acid, Tech.	lb.	.46	.48
Thermoflex	lb.	1.61	1.63
Thymol Eugenol	lb.	—	1.02
U.S.P.	lb.	—	3.50
V-G-B	**lb.**	**.55**	**.57**
Wing-Stay S	lb.	.45	.50

ANTI-SCORCHING AGENTS

Armeen HT	**lb.**	**.46**	**.54**
Benzoic Acid—Tech.	**lb.**	**—**	**.43**
Good-rite Vultrol	**lb.**	**.55**	**.57**
Retarder PD	lb.	—	.36
Retarder W	lb.	—	.43
Sodium Acetate 60-62% Crystals	**lb.**	**—**	**.06**

ANTISEPTICS AND GERMICIDES

Arquad S	**lb.**	**.24**	**.27**
Formaldehyde (barrels)	**lb.**	**—**	**.062**
G-4 (bbls.)	**lb.**	**.95**	**2.75**
G-11	**lb.**	**3.50**	**5.50**
Methyl Para Hydroxy Benzoate	**lb.**	**—**	**2.10**
Nuodex 100 S.S. (dlvd.)	**lb.**	**—**	**1.05**
Nuodex 100 W.D. (dlvd.)	**lb.**	**—**	**1.20**
Nuodex Zinc 8% (dms.) (dlvd.)	**lb.**	**—**	**.2125**
Ortho Cresol (26°-27°)	**lb.**	**—**	**.18**
Retarder D	**lb.**	**.68**	**.76**
Soligen Drier—Copper 8% (drums)	**lb.**	**—**	**.22½**
Zinc 8% (dms.)	**lb.**	**—**	**.21¼**
Vancide	**lb.**	**—**	**.80**

ANTI-WEBBING AGENTS (for Latex)

Webnix 33	lb.	1.75	2.00

AROMATICS (DEODORANTS)

Bouquet 149	lb.	—	3.00
Coumarin	lb.	—	2.75
Curodex 19	lb.	—	4.75
188	lb.	—	5.75
198	lb.	—	6.75
D-6 Masking Perfume	lb.	—	1.35
Deodorant 65	lb.	—	1.00
Deodorant L-37	lb.	2.00	2.40
L-44	lb.	2.50	2.90
N.L.T.X.	lb.	1.85	2.15
Deodorant Oil GD 3427	lb.	1.70	2.00
4440	lb.	3.00	3.50
5296	lb.	.95	1.25
General Deodorant 18301	**lb.**	**—**	**2.40**
Latex Perfume 5	lb.	—	3.25
6	lb.	—	7.50
9	lb.	—	.65
Naugaromes (dms.)	**lb.**	**1.50**	**3.00**
Neutrodor 31	lb.	2.00	2.50
Neutroleum Delta	lb.	—	2.60
Gamma	lb.	—	2.60
Parador A	**lb.**	**1.75**	**2.25**
B	lb.	.70	1.00
C	lb.	2.75	3.25
D	lb.	1.50	2.00
E	lb.	.25	.55
F	lb.	—	.47
I	lb.	—	2.00
K	lb.	—	.43
GD 5280	lb.	—	2.50
GD 5348	lb.	1.90	3.25
Perfume Oil Bouquet Vanilla M	lb.	2.40	2.75
Resodor 11	lb.	2.00	2.50
12	lb.	1.45	1.75
Rodo No 0	**lb.**	**4.00**	**4.50**
No. 10	**lb.**	**5.00**	**5.50**
Rubbarome (dms.)	**lb.**	**1.05**	**3.80**
Rubber Perfume 12	lb.	—	2.85
Russian Leather 7	**lb.**	**—**	**4.10**
Vanillin	lb.	3.00	4.00

BLOWING AGENTS

Ammonium Bicarbonate (dlvd.)	lb.	.0725	.1075
Blowing Agent CP-975	**lb.**	**—**	**.35**
Sodium Bicarbonate, U.S.P. (c.l., bags)	cwt.	—	1.95
Sponge Paste	**lb.**	**—**	**.20**
Unicel	lb.	—	.75
ND	**lb.**	**—**	**1.50**
S	**lb.**	**—**	**.25**
Urea	lb.	.0425	.0475

BONDING AGENTS

Durez 12987	**lb.**	**.48**	**.53**
Interlake Resin No. 4162	**lb.**	**—**	**1.50**
MDI	**lb.**	**7.00**	**7.75**
50	**lb.**	**3.50**	**4.00**
Pliobond 20	gal.	2.75	4.00
30	gal.	3.45	4.70
Reanite	**gal.**	**6.75**	**7.25**
Rex Compounds	**gal.**	**1.30**	**2.85**
Ty-Ply Q (BN & S)	gal.	6.75	8.00

COAGULANTS

Acetic Acid—56% (bbls.)	cwt.	8.11	8.81
Glacial—99½% (bbls.)	cwt.	14.05	14.55
Calcium Nitrate, Tech., Crystals	**lb.**	**.12½**	**.15**
Hydroxyacetic Acid—70% (dms.)	**lb.**	**—**	**.084**
Zinc Nitrate, Tech.	**lb.**	**—**	**.21½**

COLORING AGENTS

Black

Carbon Black—See *Reinforcing Agents*			
Aquablak B (also M, R)	lb.	.0725	.0875
Aquablak S	**lb.**	**.08¾**	**.09**
Black Shield 4-35 (dms.)	**lb.**	**—**	**.0825**
Lampblack No. 10	**lb.**	**.06**	**.09**
Mapico Black Iron Oxide (50 lb. bags)	**lb.**	**.1075**	**.1100**
Raven Black Pure Iron Oxide	**cwt.**	**10.75**	**11.00**

Blue

Blue GD, Dispersed	lb.	—	3.95
Blue GD Paste	lb.	—	1.80
Blue YD, Dispersed	lb.	—	2.50
Milori Blue 11840 (dlvd.)	lb.	—	.42
Monastral Fast Blue CPL	**lb.**	**—**	**1.54**
PCD, Dispersed	lb.	—	2.50
Ramapo Blue	lb.	3.40	3.45
Rubber Blue X-1999	lb.	—	1.15
Stan-Tone Blue	**lb.**	**1.40**	**4.00**
Ultramarine	lb.	.14	.30
Vansul Blue M.B.	lb.	.80	2.30
Victoria Blue BP-262-D	**lb.**	**2.25**	**2.30**

Brown

Brown Iron Oxide	lb.	.1075	.12
Mapico Brown (50 lb. bags)	lb.	—	.1250

Green

Filo Green D-700 (and D-705)	lb.	—	.30
Green Chromium Oxide, Pure	cwt.	34.50	42.00
Green Chromium Oxide, Pure, Hydrated	cwt.	90.00	110.00
Green FD, Dispersed	lb.	—	1.50
Monastral Fast Green GSD, Dispersed	lb.	—	3.20
GSL	**lb.**	**—**	**1.71**
Permansa Green CP-594	lb.	—	1.35
Pigment Green B	lb.	—	1.35
GL-652D	lb.	.88	.93
Ramapo Green	lb.	—	4.00
Rubber Green X-1292	lb.	—	1.00
Stan-Tone Green	lb.	1.50	3.30
Vansul Green M.B.	lb.	.90	2.25

Maroon

Stan-Tone Maroon	lb.	3.00	3.05
Vansul Maroon M.B.	lb.	1.05	2.80

Orange

Molybdate Orange	lb.	—	.40
Orange FD, Dispersed	**lb.**	**—**	**2.75**
Rubber Orange X-2065	lb.	—	2.60
Stan-Tone Orange	lb.	1.65	4.00
Vansul Orange M.B.	lb.	2.15	2.95

Red

Antimony Trisulfide	lb.	.55	.68
R. M. P. Sulfur Free	lb.	.63	.68
R. M. P. No. 3	lb.	.55	.60
Cadmium Red	lb.	.95	1.25
Cadmolith Red (bbls.)	**lb.**	**1.20**	**1.45**
Graphic Red (dlvd.)	lb.	—	.80
Indian Red, American, Pure	cwt.	11.50	11.75
Doxco (English)	cwt.	11.50	11.75
Mapico Reds (50 lb. bags)	lb.	.1150	.1175
Oximony Iron Oxide	lb.	—	.09
Red Iron Oxide, Light	cwt.	11.50	11.75
Red PBD Dispersed	lb.	—	1.55
2BD, Dispersed	lb.	—	1.65
2BL	**lb.**	**—**	**1.15**
PBL	lb.	—	1.50
Rubanox Red CP-762 (dlvd.)	lb.	—	1.40
Rubber Red CP-339 (dlvd.)	lb.	—	1.05
Rubber Red RT-364	lb.	—	.75
Rubber Red RT-425	lb.	—	.75
Rubber Red X-1148	lb.	—	.80
Rubbered	lb.	.1150	.1175
Solfast Red CP-663 (dlvd.)	lb.	—	1.80
CP-787 (dlvd.)	lb.	—	1.30
Stan-Tone Red	lb.	1.10	3.05
Sun Burnt Red	lb.	.1150	.1175
Vansul Red M.B.	lb.	.80	2.45
Watchung Red	lb.	—	1.80

White—Lithopone

Albalith	lb.	.06¼	.06⅜
Astrolith	lb.	.06¼	.06⅜
Cryptone No. 19	lb.	.08¼	.08½
CB No. 21	lb.	.08¼	.08½
Eagle	lb.	.06¼	.06⅜
Permalith	lb.	.06¼	.06⅜
Ponolith	lb.	.06¼	.06⅜
Sunolith	lb.	.06¼	.06⅜

White—Titanium Pigments

Rayox	**lb.**	**.19¼**	**.23¾**
Ti-Cal	lb.	.07¼	.08¼
Ti-Pure	lb.	.21½	.22½
Titanox A—all grades (dlvd.)	lb.	.19½	.20½
B-30 (dlvd.)	lb.	.07	.07½
C (dlvd.)	lb.	.06¾	.07¼
RA—all grades (dlvd.)	**lb.**	**.21½**	**.22¼**
RC-HT (dlvd.)	lb.	.07½	.08
Unitane O-220	lb.	.195	.205
OR-250	lb.	.215	.225
Zopaque	lb.	.19½	.20½

White—Zinc Oxide (American Process)

AZO-ZZZ 11 (and 22, 33, 44, 55)	lb.	.11	.11¼
Eagle	lb.	.11	.11¼
Horse Head Special	lb.	.11	.11¼
XX Red	lb.	.11	.11¼
XX-505	lb.	.12½	.12¾
Protox 166	lb.	.11	.11¼
St. Joe Black Label	lb.	.11	.11¼
Green Label	lb.	.11	.11¼
Red Label	lb.	.11	.11¼

White—Zinc Oxide (Dispersed)

Dispersed Zinc Oxide	lb.	—	13

White—Zinc Oxide (French Process)

AZO-ZZZ 66	lb.	.13¼	.13½
Eagle Green Seal	lb.	.12¾	.13
Eagle Red Seal	lb.	.12¼	.12½
Eagle White Seal	lb.	.13¼	.13½
Florence Green Seal	lb.	.12¾	.13
Red Seal	lb.	.12¼	.12½
White Seal	lb.	.13¼	.13½
Kadox 25	lb.	.13¼	.13½
Kadox 15, 17 and 72	lb.	.11	.11¼
U. S. P. 12	lb.	.14¼	.14½

White—Zinc Sulfide

Cryptone ZS-800	lb.	.13¼	.13½

Yellow

Anchor Brand Pure Iron Oxide	cwt.	9.00	9.25
Cadmolith Yellow (bbls.)	**lb.**	**—**	**.95**
Chrome Yellow	lb.	—	.28
Chrome Yellow 12310	lb.	—	.28
Ferrox	**cwt.**	**7.50**	**8.50**
Mapico Yellow (50 lb. bags)	lb.	.0900	.0925
Rubber Yellow X-1940	lb.	—	1.60
Stan-Tone Yellow	lb.	1.00	2.25
Toluidine Yellow	lb.	—	1.70
YL-556-D	lb.	—	.82
Oximony Iron Oxide	lb.	—	.06¼
Vansul Yellow M.B.	**lb.**	**.90**	**1.00**
Yellow GD, Dispersed	lb.	—	1.85
GL	**lb.**	**—**	**1.35**
Zinc Yellow	lb.	—	.21

DESTABILIZING AGENTS (for Latex)

D-Stayb	lb.	—	1.60

DISPERSING AGENTS

Agchem SA-19	lb.	—	.30
SA-20	lb.	—	.70
Aquasol AR 90%	**lb.**	**—**	**.24¼**
Armeen 18	**lb.**	**.53**	**.60**
Beaconol 52	lb.	.60	.75
Darvan No. 1 (and No. 2)	lb.	.21	.30
Daxad 11 (21, 23)	lb.	.08	.35
Dilex	lb.	—	.32
Dispersaid	lb.	1.25	1.35
Halloid	lb.	.03¼	.09½
HornKem No. 1	gal.	—	1.60
No. 3G	gal.	—	1.75
No. 12	lb.	—	.17
Lomar PW	**lb.**	**.16**	**.18**
Marasperse CB	lb.	.11½	.13½
N	lb.	.09	.10
Rubbex	lb.	—	.27½
Stan-Chem BQC	lb.	.12¼	.17¼
1067	lb.	—	.13½
1471	lb.	.1687	.2187
2251	lb.	.12¼	.17¼
Trenamine D-25	**lb.**	**.32½**	**.36**
D-100	lb.	.48	.51
Triethanolamine (drums) (dlvd.)	lb.	.21½	.22½
Triton R-100	lb.	.13½	.24
Yelkin TT	lb.	—	.22
Zinsper	lb.	—	.15

EXTENDERS

Advagum 1098	lb.	—	.62
Bunaweld Polymer No. 780	**lb.**	**—**	**.22**
No. 5514	lb.	—	.30
D-92 (and D-93) (dms.)	lb.	—	.12
Extender 600	lb.	—	.1480
PR-162 Latex (dms.)	gal.	1.00	1.60
Synprolac	lb.	—	.19
Synprowax	lb.	.16	.19
Vistanex	**lb.**	**—**	**.32**

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The VULCARITES are useful for the preparation of rubber and vulcanizable resin latices. In addition to the standard VULCARITES such as those of sulfur, zinc oxide, anti-oxidants, accelerators and blends of them, specially prepared VULCARITES are available on request to meet specific latex compounding problems.

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FILLERS (Inert and Reinforcing)

Abrasives			
Carbonite	lb.	.15	.95
Lionite	lb.	.09¼	.90
Pumice	lb.	.03	.05
Aluminum Hydrate	lb.	—	.17
Aluminum Silicate			
Silical	ton	37.00	55.00
Marter White	ton	18.50	30.00
Barium Carbonate (l.c.l.)	ton	72.50	90.00
Barytes			
No. 1 Floated, White	ton	34.85	49.65
No. 2 Floated, Unbleached	ton	—	32.85
No. 22 Barytes (c.l.)	ton	—	18.37
Foam A	ton	—	34.85
Bentonite (c.l.)	ton	—	11.50
SPV Volclay (c.l.)	ton	—	11.50
Blanc Fixe	ton	72.50	120.00
Calcium Carbonate			
Atomite (c.l.)	ton	—	30.00
B.I. White No. 1 (c.l.)	ton	—	7.50
B.I. White No. 2 (c.l.)	ton	—	7.00
B.I. White No. 390 (c.l.)	ton	—	5.75
Blue-Star XX	ton	—	15.00
Calcene T	ton	45.00	55.00
Caltec	ton	40.00	67.50
Calwhite	ton	—	17.00
Camelwite	ton	—	30.00
Kalite (c.l.)	ton	—	40.00
Lesamite (c.l.)	ton	—	27.50
Lim-Cal (c.l.)	ton	—	12.50
Micronite	ton	—	33.00
Millical (c.l.)	ton	—	27.50
Multifex	ton	—	105.00
Non-Fer-Al	ton	—	20.00
Purecarb M	ton	105.00	120.00
U	ton	45.00	66.00
Sierracal	ton	15.00	18.50
Super Multifex	ton	—	145.00
Surfex (c.l.)	ton	—	30.00
Suspenso (c.l.)	ton	—	22.00
Witcarb R (c.l.)	ton	105.00	120.00
R-12 (c.l.)	ton	45.00	66.00
York White	ton	—	9.00
Calcium Silicate			
Silene EF	ton	110.00	120.00
Calcium Sulfate, Anhydrous			
Snow White Filler	ton	—	18.00
Calcium Sulfate, Hydrous			
Crysta-Cal (c.l.)	ton	—	12.50
Terra Alba No. 1	ton	12.00	14.40
Chalk Whiting (l.c.l.)	lb.	.0150	.0175
Recco Paris Whiting	ton	—	28.00
Clay			
Alsilite (c.l.)	ton	14.00	22.50
Alsite (c.l.)	ton	—	14.00
Aluminum Flake	ton	16.50	36.00
A.S.P. No. 1 (c.l.)	ton	—	35.00
No. 11 (c.l.)	ton	—	40.00
Buca (c.l.)	ton	—	45.00
Burgess No. 20	ton	—	35.00
No. 30	ton	—	37.00
Burgess Iceberg	ton	—	50.00
Burgess Polyclay	ton	—	45.00
Catalpo (c.l.)	ton	—	35.00
Champion	ton	—	14.00
C.S.D. (c.l.)	ton	—	13.00
Crown	ton	—	14.00
Dixie (c.l.)	ton	—	14.00
Hi-White R	ton	—	13.50
Hydratex R	ton	—	30.00
Kaolloid Clay (c.l.)	ton	—	10.50
Markham (c.l.)	ton	14.00	35.00
McNamee (c.l.)	ton	—	13.50
Oldham (c.l.)	ton	13.50	35.00
Paragon	ton	—	13.50
Pigment 33	ton	—	37.00
Recco (c.l.)	ton	—	14.00
Stellar-R	ton	—	50.00
Suprex	ton	—	14.00
Upton	ton	19.50	21.50
Whitetex (c.l.)	ton	—	50.00
Witco No. 1 (c.l.)	ton	14.00	37.50
No. 2 (c.l.)	ton	14.00	37.50
Diatomaceous Earth	ton	30.00	50.00
Kaylorite (c.l.)	ton	—	30.00
Lorite	ton	—	30.00
Dolomite (c.l.)	ton	11.00	12.00
Flock			
Cotton, white and colored	lb.	.10	.20
Fifloc F 40-9000	lb.	—	.16
Fifloc F 6000	lb.	—	.22
Polycel	ton	145.00	178.00
Rayon, bleached or dyed	lb.	.81	1.50
Rayon, grey	lb.	—	.18
Rayon, pink	lb.	—	.14
Solka-Floc (l.c.l.)	lb.	.05	.15
Wool, bleached or dyed	lb.	.70	1.00
Glue, Bone (dlvd.)	lb.	.18	.20½
Graphite	lb.	.05	.20
Ground Glass (l.c.l.)	lb.	.04	.06
Leather, Shredded	lb.	.05	.17
Lignin	lb.	.03	.06
Indulin	lb.	.09	.10
Limestone, Pulverized	ton	3.25	10.00
Micro Velva	ton	45.00	47.00
Velvet Filler, Regular	ton	20.00	22.00
Magnesium Carbonate	lb.	.09	.10
R & M Clearcarb	lb.	.1175	.1225
Magnesium Oxide	lb.	.05	.06
Magnesium Silicate	ton	18.00	35.00
Airex	ton	25.00	27.00
Asbestol	ton	20.00	22.00
Blue Star Talc	ton	—	23.00
L.S. Silver	ton	23.50	25.50
Sierra White	ton	21.25	23.25

FILLERS (Cont'd)

Mica	lb.	.01¼	.07¾
Concord	lb.	.0675	.0750
Micro-Mica	lb.	.06¾	.07½
Mineralite (c.l.)	ton	25.00	40.00
Silversheen	lb.	.06¾	.07½
Triple A Mica (c.l.)	ton	—	25.00
Vermiculite	lb.	.075	.085
Wet Ground Biotite Mica	lb.	.05½	.06¼
Wet Ground Mica No. 160	lb.	.06¾	.07½
Mineral Black			
Keystone 126	ton	15.00	20.00
Pyrophyllite			
Pyrax A (c.l.)	ton	—	12.50
WA (c.l.)	ton	—	15.00
Silica	ton	16.00	27.00
Blue Star	ton	—	21.50
Hi-Sil	ton	220.00	240.00
Slate, Powdered (l.c.l.)	ton	15.00	20.00
Talc, Domestic	ton	9.00	20.00
Nytal 200	ton	23.00	40.00
300	ton	35.00	52.00
Walnut Shell Flour	ton	40.00	100.00
Whiting, Commercial	ton	—	12.00
Cameline (c.l.)	ton	8.50	10.00
C-C-O White	ton	—	17.00
Keystone (c.l.)	ton	—	16.00
Rambo No. 1 White	ton	—	6.50
No. 6 White	ton	—	9.00
Snowflake (c.l.)	ton	—	18.00
Veroc (c.l.)	ton	—	6.50
Welco (c.l.)	ton	—	7.50
York White R (c.l.)	ton	—	8.00
Wood Flour	ton	20.00	62.18

FINISHING MATERIALS, SURFACE

Beaco Finishes	gal.	1.05	1.35
Black Out	gal.	4.50	8.00
Shellac, Orange Gum	lb.	.45	.54
VanWax	gal.	1.25	1.30

FLAME RETARDANTS

Celluflux	lb.	.36½	.38½
Chlorinated Paraffin 42	lb.	—	.12¼
Halowax	lb.	.24	.39
Zinc Borate 3167	lb.	.15½	.16
Zyrox	lb.	.65	.79

LUBRICANTS, MOLD

Aquadag	lb.	3.15	3.45
Aquarex D	lb.	—	.76
L Paste	lb.	—	.85
ME	lb.	—	.92
MDL Paste	lb.	—	.30
WA Paste	lb.	—	.75
Akro Gel	lb.	—	.165
Borax, Granular (l.c.l.)	ton	70.00	80.00
Colite Concentrate (dms.)	gal.	—	.90
Concentrex	lb.	—	.25
D.C. 7 Compound	lb.	6.20	6.80
D.C. Emulsion No. 35	lb.	1.84	3.50
35A	lb.	1.84	3.50
D.C. Mold Release Fluid	lb.	4.90	6.00
Dipex	lb.	.14	.18
Dri-Lube	lb.	—	.22
Erlen Mold Lubricant	gal.	1.25	1.50
Glydag	lb.	1.30	2.00
Hawkeye Flake (dlvd.)	lb.	—	.12
Kokobace	lb.	—	.12
Latex-Lube (dlvd.)	lb.	—	.18½
Liqui-Lube (dlvd.)	lb.	—	.14¾
Lubrex	lb.	.25	.30
Migralube	lb.	—	.37
Moldeze No. 1	gal.	—	36.00
No. 3	gal.	—	7.50
Mold Lubricant No. 72 Conc.	gal.	2.50	4.00
No. 735	gal.	1.26	2.75
No. 765	gal.	2.50	4.00
No. 767	gal.	1.52	3.00
No. 768	gal.	2.50	4.00
No. 769	gal.	1.20	2.70
Mold-Slick	lb.	.202	.215
Orvus WA Paste (dms.)	lb.	—	.25
Prodag	lb.	.25	.38
Purity Flake (dlvd.)	lb.	—	.14
Redotex Flakes (dlvd.)	lb.	.14¾	.15
Powder (dlvd.)	lb.	.14⅞	.15½
Rubber-Flo	gal.	1.15	1.50
Rubber-Glo	gal.	—	.94
Rusco Mold Paste	lb.	—	.25
Sericite (l.c.l.)	ton	65.00	75.00
Thermalube	lb.	—	.11
Ulco Mold Soap	lb.	.16	.29
Werkrite Flakes (dlvd.)	lb.	.10⅞	.11½
Powder (dlvd.)	lb.	.11⅝	.12¼

LUBRICANTS, RUBBER

Extrud-o-Lube	gal.	—	1.57
G.B. Naphthenic Neutrals	gal.	.12	.18
Propylene Stearate (drums)	lb.	—	.40

LUBRICANTS, RUBBER SURFACE

Barium Stearate	lb.	.34	.36
Calcium Stearate	lb.	.32	.34
Glycerized Lubricant	gal.	—	1.25
Polyethylene Glycol	lb.	.25	.26
Rexanol	lb.	—	.13
Separex	lb.	—	.15
Slab-Dip	lb.	—	.15
Wet-Zinc	lb.	—	.22
Zinc Stearate	lb.	.34	.36

MOLD CLEANERS

Actusol (dlvd.)	gal.	—	1.45
Metso 99	cwt.	3.75	5.40
Granular	cwt.	3.25	4.75
Rubber-Sol	gal.	—	2.75
Shellblast	ton	80.00	140.00
Sprex A.C. (dlvd.)	lb.	—	.15½

PEPTIZING AGENTS

Peptizer P-12	lb.	.84	.90
RPA 2	lb.	—	.65
3	lb.	—	.46
3-RO	lb.	—	.49
5	lb.	—	.57

PLASTICIZERS & SOFTENERS

AA (drums)	lb.	—	.18¾
Acto 500	lb.	—	.09
Adipol BCA (dms.)	lb.	.44½	.45
2EH	lb.	.45½	.46
10A	lb.	.44½	.45½
American Pine Tar	lb.	.0350	.0473
Arneel	lb.	.26	.36
Arolene 1980 (c.l.)	lb.	—	.10
Aromatic Tar	gal.	.0573	.1973
Bardol	lb.	.02½	.03½
B	lb.	.05½	.05¾
Bayol D	gal.	—	.382
F	gal.	—	.52
Beeswax, Refined & Bleached	lb.	—	
Yellow Refined	lb.	—	.59
Bondogen	lb.	.55	.6
B.R.C. No. 20	lb.	.0125	.0135
B.R.H. 2	lb.	.02	.029
BRS 700	lb.	.0175	.026
B.R.T. 3	lb.	.024	.025
4	lb.	.0225	.0235
7	lb.	.0265	.0275
B.R.V.	lb.	.0325	.04
Bunarex Resins	lb.	.05½	.06
Bunatak M	lb.	—	.20
O	lb.	—	.1
R	lb.	—	.14
U	lb.	—	.15
No. 21	lb.	—	.08
No. 90	lb.	—	.08
No. 865	lb.	—	.17
No. 1080	lb.	—	.09½
Burgundy Pitch	lb.	.1026	.1050
Butac	lb.	.10½	.11½
Butoxyethyl Diglycol Carbonate	lb.	.40	.41
Butyl Benzyl Sebacate	lb.	.52	.54½
Butyl Carbitol Perlargonate (dms.)	lb.	—	.640
Butyl Cellosolve Perlargonate (dms.)	lb.	—	.68
Butyl Palmitate	lb.	—	.26½
Butyl Roleate	lb.	.176	.18
Butyl Stearate-CP (dms.)	lb.	.27	.28
BWH-1	lb.	—	.14
Califlux 510, 550	lb.	.025	.0325
G.P.	lb.	.0125	.02
R-100	lb.	.04½	.05¼
TT	lb.	.02	.02¾
Campol (t.c.)	ton	—	42.00
Candelilla Wax Prime	lb.	.67	.75
Capryl Benzyl Sebacate	lb.	.59½	.62
Carbonex	lb.	.0325	.0375
S Flakes	lb.	.04	.045
S Plastic	lb.	.0385	.0435
644	lb.	.0375	.0425
Carbowax 4000 (drums)	lb.	.31	.32
Cardolite 615	lb.	.33¾	.36¼
816	lb.	.25¾	.28¾
Carnauba Wax, Crude	lb.	.83	.92
Refined	lb.	.87	.94
Substitute	lb.	.45	1.08
Yellow	lb.	1.15	1.20
Celluflex	lb.	.36½	.38½
Cerasine Wax	lb.	.14	.26
Contogum	lb.	.06¾	.10¼
CTLA Polymer	gal.	.15	.29
Cumar Resins	lb.	.05½	.14½
D.C. 200 Fluid	lb.	5.20	6.00
D.B.M.	lb.	—	.30
Degras, Common	lb.	—	.12
Diamylphenol (l.c.l., dms.)	lb.	—	.28
Dibenzyl Sebacate	lb.	.65	.67½
Dibutoxethyl Sebacate	lb.	—	.5634
Diethyl Phthalate (t.c.)	lb.	—	.24½
Dibutyl Sebacate—Tech.	lb.	.47½	.50
C.P.	lb.	.49½	.52
Dicapryl Adipate	lb.	.41	.43½
Dicapryl Phthalate	lb.	.37	.39½
Dicapryl Sebacate	lb.	.53	.55½
Di-Carbitol Phthalate (dms.)	lb.	.43½	.44
Dicyclohexyl Phthalate	lb.	—	.42
Dielex	lb.	.0625	.0650
Diethyl Phthalate (t.c.)	lb.	—	.24½
Dihexyl Adipate	lb.	.32½	.35
Dihexyl Phthalate	lb.	.29	.31½
Dihexyl Sebacate	lb.	.41	.43½
Di Isobutyl Azelate (dms.)	lb.	.54	.57
Di-iso-octyl Adipate (dms.)	lb.	.42	.44½
Di-iso-octyl Phthalate (t.c.)	lb.	.40	.42½
Dimethyl Phthalate	lb.	—	.25
Dimethyl Sebacate	lb.	.68	.70½
Dinopol (dms.)	lb.	.523	.533
Dioctyl Phthalate (dms.)	lb.	.40½	.42½
Dioctyl Sebacate (dms.)	lb.	.54	.56½
D.I.O.P. (dms.)	lb.	.41½	.42½
Dipolymer Oil	gal.	.33	.38

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- GR-S Latex Concentrate
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PLASTICIZERS & SOFTENERS (Cont'd)

Dispersing Oil No. 10	lb.	.0525 -	.055
Dutrex A (B, 5, 6)	lb.	.02½ -	.03¼
15	gal.	.10 -	.189
20, 21, 25	lb.	— -	.03
Elastex 10-P	lb.	.40 -	.42½
50-B	lb.	.34½ -	.37
DCHP	lb.	.42½ -	.43½
Estac	lb.	— -	.16
Ethox (dms.)	lb.	.44½ -	.45
Flexol B-400	lb.	.27 -	.29
DOP	lb.	.40 -	.42½
TOF	lb.	.39½ -	.42
3GH	lb.	.42 -	.44
3GO	lb.	.51½ -	.53½
4GO	lb.	.36 -	.38½
8HP	lb.	.38 -	.40½
8N8	lb.	.37½ -	.40
Galex W-100	lb.	.13½ -	.15
G. B. Light Process Oil	lb.	.025 -	.0325
G. B. Napthenic Neutrals, Harflex 500 (dmsg.)	lb.	.34 -	.36½
Hercolyn (dlvd.)	lb.	.16 -	.16½
Herron-H.T.	gal.	.2400 -	.2700
Herron-Pias	lb.	.0350 -	.0375
Herron-Wax	lb.	.0500 -	.0550
HT-400	lb.	.45¾ -	.53
Indonex 632½ (633½, 634½, 638½)	gal.	.1100 -	.1700
Indopol H-300 (bbls.)	gal	1.12 -	1.16
JMH	lb.	— -	.85
Kapsol	lb.	.34½ -	.35
KP 23 (dms)	lb.	.34½ -	.35
70 (dms.)	lb.	.38½ -	.39
120 (dms.)	lb.	.37½ -	.38
140 (dms.)	lb.	.49½ -	.50
150 (dms.)	lb.	.34 -	.34½
201	lb.	.41½ -	.42
Kremol 40	gal.	.36 -	.46
50	gal.	.36 -	.46
Kronisol (drums)	lb.	.38½ -	.39
Kronitex (drums)	lb.	.30½ -	.31
Lanolin, Tech. Anhydrous	lb.	.23 -	.25
Lead Oleate		— -	.30½
Lindol		.29 -	.45
2-Mercaptoethanol (druma)	lb.	— -	.75
Methox (dms.)	lb.	.41 -	.41½
Methyl Laurate	lb.	.25 -	.27
Methyl Oleate	lb.	— -	.20
Methyl Stearate (dms.)	lb.	— -	.30
Monoplex DBS	lb.	.51 -	.52
Monoplex DOS	lb.	.55½ -	.56½
5 (dms.)	lb.	.70 -	.71
11 (dms.)	lb.	.50 -	.51
16 (dms.)	lb.	.45 -	.46
Montan Substitute No. 506	lb.	.32 -	.33
Montan Wax, Crude	lb.	.18 -	.20
Montan Wax (c.l.)	lb.	.15 -	.18
Monty Wax	lb.	— -	.30½
Natac	lb.	.10 -	.11
Neolene 210 (t.c.)	lb.	— -	.16
212 (t.c.)	lb.	— -	.14
220 (t.c.)	lb.	— -	.15
Nerium	lb.	— -	.09
Nevillac Resins (dms.)	lb.	.23 -	.45
Neville Resins (dms.)	lb.	.10½ -	.15½
Nevindene Resins (dms.)	lb.	.12½ -	.15½
Nevinol (dms.)	lb.	— -	.17
Nevoil	lb.	.02½ -	.04¼
Nevtex 10 (dms.)	lb.	.08¾ -	.10½
Nuba 1 (and 2) (dms.)	lb.	— -	.04
3X (dms.)	lb.	.05¾ -	.06¼
15 (and 30) Oil (dms.)	lb.	— -	.24
781 Oil (dms.)	lb.	— -	.27
No. 480 Oil Proof Resin	lb.		.13½
Oboprex Q10 (dms.)	lb.	.40½ -	.41½
Opalwax	lb.	.37 -	.38
Ortho-Nitrobiphenyl	lb.	.06 -	.11
Ozokerite Wax No. 64 White	lb.	.31 -	.32
Yellow	lb.	.25 -	.26
P-1 (and 4)	lb.	— -	.28½
P-4C	lb.	— -	.38½
P-8	lb.	— -	.27½
P-75	lb.	.66 -	.72
Pale 4 (and 1000)	lb.	— -	.24
Palm Oil	lb.	— -	.11
Paradene Resins (dms.)	lb.	.05 -	.06
Para Flux (dms.)	gal.	.1825 -	.1925
2016 (dms.)	gal.	.22 -	.23
Para Lube (t.c.l.)	lb.	.046 -	.048
Paraplex G-25	lb.	.69 -	.70
G-40	lb.	.43 -	.44
G-50	lb.	.39½ -	.40½
G-60	lb.	.39½ -	.40½
Parmo	lb.	.06 -	.13¾
Pepton 22	lb.	.72 -	.75
PG-16 (drums)	lb.	— -	.23½
Picco 10 (and 25)	lb.	— -	.12
75 (and 100)	lb.	— -	.11½
Rubber Resin 100	lb.	.13¾ -	.14
S.O.S.	gal.	.29 -	.34
Piccolube 30	lb.	.05½ -	.06
Piccolastic A (and B, C, D, E)	lb.	.22 -	.22½
F	lb.	.139 -	.144
Piccolyte S Resins	lb.	.0795 -	.1245
Piccolyte WW Resins	lb.	.45 -	.47
Piccoumaron Resins	lb.	.05 -	.14½
Piccovar	lb.	.09¼ -	.11¼
Piccovol	lb.	.02½ -	.04
Pictar	gal.	.25 -	.30
Plas-Blend 360	lb.	.03 -	.04
Plastac M	lb.	— -	.09¼
Plasticizer 2286	lb.	— -	.25

PLASTICIZERS & SOFTENERS (Cont'd)

Plasticizer SC	lb.	.49 -	.52
Plasticizer VA-1	lb.	— -	.40
Plasticizer XP-3	lb.	— -	.50
Plastoflex 3	lb.	— -	.50
50	lb.	— -	.38
J-21	lb.	— -	.41
Plastogen	lb.	.07¾ -	.08
Plastolein 9050	lb.	— -	.45
9055	lb.	— -	.37
9058	lb.	— -	.45
9250	lb.	— -	.32
9715	lb.	— -	.36
Plastolein X-55 (dms.)	lb.	— -	.60
X-148 (dms.)	lb.	— -	.70
Plastone	lb.	.27 -	.30
Polymel D	lb.	— -	.20
Polymel Liquid	gal.	.12 -	.17
Polymel Resins	lb.	.029 -	.05
Process Oil C-225 (c.l.)	gal.	— -	.22
Propylene Stearate (dms.)	lb.	— -	.32
PT 400 Pine tar (600, 800) (t.c., dms.)	gal.	.34½ -	.45¹
Reogen	lb.	.11½ -	.12
465 Resin (drums)	lb.	.05 -	.05½
Resin 731-C	cwt.	— -	13.50
Resin C	lb.	.0250 -	.0335
Resinex	lb.	.03¼ -	.04
L-4	lb.	.02¼ -	.03
Ridbo 369 (drums)	lb.	.08 -	.09
369-F (drums)	lb.	— -	.12
Rosin Oil	gal.	.54 -	1.20
R.P.A. No. 2	lb.	— -	.65
No. 3	lb.	— -	.46
No. 5	lb.	— -	.57
R.S.O. Softening Oil	lb.	.03 -	.05
Rubberol	lb.	— -	.21½
Rubtar	gal.	— -	.40
Santicizer B-16	lb.	.50 -	.52
E-15	lb.	.47 -	.49
M-17	lb.	.44 -	.46
No. 107	lb.	.40 -	.42½
No. 140	lb.	.29 -	.31
No. 141	lb.	.40 -	.42½
No. 160	lb.	.34 -	.36
Sealol 42	gal.	— -	1.10
Sherolatum	lb.	.02½ -	.04½
Sheroscope I.	lb.	.13¾ -	.15
Softener No. 20	gal.	.09 -	.25
S.P.C.	lb.	— -	.19½
Staflex IXA	lb.	.34 -	.36
Stanolind Petrolatum	lb.	.037 -	.081
Wax	lb.	.25 -	.30
Staybelite Resin (dms.)	cwt.	— -	9.00
Sunny South Burgundy Pitch	lb.	.0774 -	.0789
Sunny South Pine Tar	lb.	.0350 -	.0473
Sunny South Rosin Oil	gal.	.47 -	.63
Superla Wax	lb.	.25 -	.30
Syncera Wax	lb.	.175 -	.225
Synplasticizer	lb.	— -	.10
Syn Tac (c.l.)	gal.	— -	.33
Tar, Refined	gal.	.12 -	.17
K-Tarnel NR (t.c.)	lb.	— -	.0851
Ternene A	gal.	— -	.65
TP-90B	lb.	— -	.65
TP-95	lb.	— -	.55
TP98	lb.	— -	.50
Triacetin	lb.	.34 -	.45
Tricresyl Phosphate	lb.	.29 -	.31
Turgum S	lb.	.08¾ -	.09¾
Vanadiset A	gal.	.13 -	.20
Vanadiset B, C, D	lb.	.022 -	.055
Pulverized	lb.	.064 -	.09
Solution	gal.	.40 -	.65
Vistac No. 1	gal.	— -	1.32
No. 2	gal.	— -	1.66
No. 4	gal.	— -	1.80
Witresin—Granular	ton	41.00 -	43.00
Solid	ton	36.00 -	38.00

PROCESSING AIDS

Castor Oil, Processed (dms.)	lb.	— -	.20¾
Refined (drums)	lb.	— -	.15¾
Castorwax (min. 400 lbs.)	lb.	— -	.31
Dutrex 7	lb.	.02½ -	.03¾
30	gal.	.24 -	.27
ELA	lb.	— -	.80
Heron S.P.O.	lb.	.22 -	.23
Millrex	lb.	— -	.15
Resin No. 510	lb.	.13½ -	.16½
Zyrox	lb.	.65 -	.79

PROTECTIVE & STABILIZING AGENTS

Acacia	lb.	.12¾ -	.21
Agchem SA-9 (to SA-12)	lb.	.65 -	1.02
Alpha Protein	lb.	.19 -	.23
Ammonium Alginate	lb.	— -	.95
Arocostarat	lb.	— -	.07½
Carob Bean Flour	lb.	.33 -	.35
Casein	lb.	.21 -	.28
Ethylene Diamine 68%	lb.	.57 -	.58
Karaya Gum	lb.	.20 -	.50
Polycin 781	lb.	— -	.22½
Prosein	lb.	.0575 -	.0605
Rex Compound No. 2801	lb.	— -	.15
Stablex B	lb.	— -	.95
Tragacanth Flakes	lb.	.60 -	1.35

RECLAIMING AGENTS

Armeers C	lb.	.50 -	.58
T	lb.	.42 -	.50
No. 517 H.B. Oil	gal.	.11½ -	.16½
535	gal.	.22 -	.27
C-6 Oil (and 28, 32)	gal.	.33 -	.38

RECLAIMING AGENTS (Cont'd)

C-10 Oil	gal.	.25 -	.30
C-33 Oil	gal.	.17½ -	.22½
Caustic Soda—Flake 76% (c.l., drums)	cwt.	— -	3.45
Liquid 50% (t.c.)	cwt.	— -	2.40
Solid 76% (c.l., dms.)	cwt.	2.50 -	3.05
Cresylic Acid (99-100%)	gal.	1.55 -	1.69
D-4	gal.	.23 -	.28
E-5	gal.	.21 -	.26
G. B. Reclaiming Oil	gal.	.12 -	.18
Heavy Aromatic Naphtha (t.c.)	gal.	— -	.125
LX-77 Reclaiming Solvent	gal.	.21 -	.30
LX-572 Reclaiming Oil	gal.	.23 -	.28
Neo-Fat D-242	lb.	.05¾ -	.07¾
PRR 1	gal.	.15 -	.35
PT 67 Light pine oil	gal.	.60 -	.70
PT 101 Pine tar oil	gal.	.32 -	.43
PT 150 Pine solvent	gal.	.44 -	.45
Q Oil	gal.	.246 -	.296
Reclaiming Oil 1621	lb.	.03 -	.04
Reclaiming Oil 3186 (t.c.)	gal.	.28 -	.38½
Reclaiming Oil 3186-G	gal.	.25 -	.36½
Reclaiming Reagent No. 4	lb.	.12 -	.15
R.P.A. No. 3	lb	— -	.46
Soda Ash (c.l., bags)	cwt.	— -	1.40
Solvenol 1 (dms.)		— -	.36
Solvent 534	gal.	.20½ -	.26½
Solvent Oil 21	gal.	.24 -	.29
C-42	gal.	.25 -	.30
Union Solvent 4060-O	gal.	— -	.147
X-1 Resinous Oil	lb.	.0190 -	.0250
X-60 Solvent	gal.	.24 -	.32

REINFORCING AGENTS—CARBON BLACK

Channel, Hard Processing (HPC) (bags)

Atlantic HPC-98	lb.	.0690 -	.1175
Continental F	lb.	.0690 -	.1125
Croflex	lb.	.0690 -	.1125
Crow	lb.	.0690 -	.1125
Dixiedensed (and S)	lb.	.0690 -	.1125
Kosmobile (and S)	lb.	.0690 -	.1125
Kosmos T	lb.	.0690 -	.1125
Micronex HPC	lb.	.0690 -	.1125
Spheron 4	lb.	.0690 -	.1170
Witco Disperso No. 6	lb.	.0690 -	.1125

Channel, Medium Processing (MPC) (bags)

Atlantic MPC-95	lb.	.0690 -	.1175
Continental A	lb.	.0690 -	.1125
Croflex TH	lb.	.0690 -	.1125
Dixie R-1	lb.	.0690 -	.1125
Dixiedensed HM (and S-66)	lb.	.0690 -	.1125
Huber Arrow TX	lb.	.0690 -	.1150
Kosmobile HM (and S-66)	lb.	.0690 -	.1125
Kosmos M	lb.	.0690 -	.1125
Micronex Standard	lb.	.0690 -	.1175
Spheron 6	lb.	.0690 -	.1170
Texas M	lb.	.0690 -	.1125
Witco Disperso No. 1	lb.	.0690 -	.1125

Channel, Easy Processing (EPC) (bags)

Atlantic EPC E-42	lb.	.0690 -	.1175
Continental AA	lb.	.0690 -	.1125
Croflex 77	lb.	.0690 -	.1125
Dixiedensed 77	lb.	.0690 -	.1125
Kosmobile 77	lb.	.0690 -	.1125
Micronex W-6	lb.	.0690 -	.1175
Spheron 9	lb.	.0690 -	.1170
Texas E	lb.	.0690 -	.1125
Witco Disperso No. 12	lb.	.0690 -	.1125
Wyex	lb.	.0690 -	.1150

Channel, Conductive (CC) (bags)

Dixie 5 dustless	lb.	.0800 -	.1375
Kosmink dustless	lb.	.0800 -	.1375
Spheron C	lb.	.1200 -	.1600
Spheron N	lb.	.2200 -	.2500
Voltex	lb.	.1800 -	.2150

Furnace, Fast Extruding (FEF) (bags)

Statex M	lb.	.0550 -	.0950

Furnace, High Modulus (HMF) (bags)

Continex HMF	lb.	.0500 -	.0900
Dixie 40	lb.	.0500 -	.0900
Dixie 50	lb.	.0550 -	.0950
Kosmos 40	lb.	.0500 -	.0900
Kosmos 50	lb.	.0550 -	.0950
Modulex A	lb.	.0500 -	.0900
Philblack A	lb.	.0550 -	.0950
Statex 93	lb.	.0500 -	.0900
Sterling L	lb.	.0500 -	.0900
Sterling SO	lb.	.0550 -	.0950

Furnace, Reinforcing (RF) (bags)

Dixie 60	lb.	.0740 -	.1125
Kosmos 60	lb.	.0740 -	.1125

Furnace, Semi-Reinforcing (SRF) (bags)

Continex SRF	lb.	.0350 -	.0775
Dixie 20	lb.	.0350 -	.0750
Essex	lb.	.0350 -	.0775
Furnex	lb.	.0350 -	.0750
Gastex	lb.	.0350 -	.0775
Kosmos 20	lb.	.0350 -	.0750
Pelletex	lb.	.0350 -	.0775
Seminex	lb.	.0350 -	.0775
Sterling NS	lb.	.0350 -	.0775
Sterling R	lb.	.0350 -	.0775
Sterling S	lb.	.0350 -	.0775

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Chewing Gum Raw Materials

REINFORCING AGENTS—CARBON BLACK (Cont'd)

Furnace, Fine (FF) (bags)

Statex B	lb.	.0575 -	.0975
Sterling 99	lb.	.0650 -	.1050
Sterling 105	lb.	.1200 -	.1600

Furnace, High Abrasion (HAF) (bags)

Aromex	lb.	.0740 -	.1125
Philblack O	**lb.**	**.0745 -**	**.1145**
Vulcan 3	lb.	.0740 -	.1170

Furnace, Very Fine (VFF) (bags)

Statex K	lb.	.0740 -	.1200

Thermal, Fine (FT) bags)

P-33	lb.	— -	.0500

Thermal, Medium (MT) (bags)

Thermax (c.l.)	lb.	— -	.0300
Thermax, Stainless	**lb.**	**— -**	**.0350**

REINFORCING AGENTS—MISCELLANEOUS

Darex Copolymer No. 3 (and X34)	lb.	.35 -	.42
No. X43	**lb.**	**.36 -**	**.38**
Darex Copolymer Latex No. 3 (and X34)	**lb.**	**.36½ -**	**.50**
Durez 12687 (and 12707)	**lb.**	**— -**	**.32**
Durez 13355	**lb.**	**— -**	**.26**
Marbon S and S-1	**lb.**	**.36 -**	**.43**
8000	lb.	.36 -	.43
Marmix	lb.	.36 -	.43
Pliolite Latex 190	lb.	.35 -	.39
Pliolite S6 Resin	**lb.**	**.36 -**	**.37**
C-3 Masterbatch	lb.	.47 -	.48
C-4 Masterbatch	lb.	.45 -	.46
G Masterbatch	**lb.**	**.35 -**	**.36**
G50 Masterbatch	**lb.**	**.35 -**	**.36**
N Masterbatch	lb.	.40 -	.41
R Masterbatch	**lb.**	**.38 -**	**.39**
Polyco 220	lb.	.13 -	.15

RETARDERS

Dutch Boy Normasal	lb.	— -	.41¾
ESEN	lb.	— -	.36
Retarder ASA	**lb.**	**— -**	**.45**
Retarder W	**lb.**	**— -**	**.43**
Retardex	lb.	.47 -	.50

RUBBER SUBSTITUTES

Mineral Rubber

38	ton	38.00 -	40.00
Black Diamond	ton	38.00 -	40.00
Byerlyte	ton	47.00 -	54.00
Gilsonite, Seiberts (c.l.)	ton	33.50 -	36.00
Hard Hydrocarbon (dma.)	**ton**	**44.50 -**	**46.50**
Herron Flake	**ton**	**48.50 -**	**49.50**
Mineral Rubber, solid	ton	42.50 -	44.50
Pioneer	ton	35.00 -	46.00

Vulcanized Vegetable Oils (Factice)

Amberex	lb.	.28 -	.32
Brown	lb.	.1310 -	.1955
Dispersed	lb.	.22 -	.42
Neophax	lb.	.16 -	.24
White	lb.	.13 -	.24

Miscellaneous Rubber Substitutes

G.B. Asphaltenes	lb.	.06 -	.06½
Gilsowax	**lb.**	**.04½ -**	**.05**
Insulac	**lb.**	**.06 -**	**.06½**
Resin No. 1098 (drums)	lb.	— -	.62
No. 1198	lb.	.46¾ -	.49¾

SOLVENTS

Acetone (dlvd.)	lb.	.07½ -	.09½
American Dipentine	gal.	.35 -	.36
American Pine Oil	gal.	.60 -	.61
Amsco Lactol Spirits (t.c.)	**gal.**	**— -**	**.16**
Rubber Solvent (t.c.)	**gal.**	**— -**	**.15**
Solv A (t.c.)	gal.	— -	.20
Solv A-80 (t.c.)	gal.	— -	.24
Solv B (t.c.)	gal.	— -	.23½
Solv B-90 (t.c.)	gal.	— -	.26½
Solv D (t.c.)	gal.	— -	.25½
Solv F (t.c.)	gal.	— -	.25½
Special Naphthalite (t.c.)	gal.	— -	.15
Textile Spirits (t.c.)	**gal.**	**— -**	**.16**
Amyl Chlorides, Mixed (l.c.l.) (drums)	lb.	— -	.08
Aromatic Solvent 40	**gal.**	**— -**	**.199**
Benzol 90%	**gal.**	**.17 -**	**.24**
Butyl Acetate (t.c.)	**lb.**	**— -**	**.175**
Butyl Alcohol (t.c.)	**lb.**	**— -**	**.175**
Secondary (dlvd.)	lb.	.09 -	.11
Tertiary (dlvd.)	**lb.**	**.12 -**	**.14**
Carbon Bisulfide, Tech.	lb.	.05½ -	.08½
Carbon Tetrachloride	lb.	.08 -	.08½
Cosol 1	**gal.**	**.30 -**	**.38**
Cosol 2	**gal.**	**.30 -**	**.38**
Cyclohexane	lb.	.09¾ -	.11¼
Cyclohexanone	**lb.**	**.25 -**	**.27** [a]
Diacetone, Pure (dlvd.)	lb.	.12 -	.14

SOLVENTS (Cont'd)

Dichlorethyl Ether (dma.)	**lb.**	**.165 -**	**.17**
Formal (dma.)	**lb.**	**.265 -**	**.27**
Dichloropentane (l.c.l.)	lb.	.04 -	.05½
Dipentene 122 (dma.)	**gal.**	**.35 -**	**.36**
Ethyl Alcohol (t.c.)	**gal.**	**— -**	**.375**
Ethyl Alcohol SD-1 (t.c.)	**gal.**	**— -**	**.43**
Ethyl Alcohol SD-2B (t.c.)	**gal.**	**— -**	**.41½**
Ethylene Dichloride (drums, dlvd.)	lb.	.08 -	.09½
Halowax Oil	**lb.**	**.25 -**	**.37**
Heptanes (t.c.)	**gal.**	**— -**	**.16**
Hexalin Cyclohexanol	lb.	.20 -	.22 [a]
Hexanes (t.c.)	**gal.**	**— -**	**.16**
Isopropyl Alcohol, Ref. 99% (dlvd.)	gal.	.31 -	.44
Ether, Ref. (dlvd.)	gal.	.27 -	.39
Mesityl Oxide (dlvd.)	**lb.**	**.115 -**	**.135**
Methanol (dms., dlvd.)	**gal.**	**.43 -**	**.495**
Methyl Acetone, Syn. (drums, dlvd.)	gal.	.615 -	.65
Methyl n-Amyl Ketone (drums)	**lb.**	**.37 -**	**.39**
Methyl Ethyl Ketone	lb.	.09 -	.11
Methyl Isobutyl Ketone (dlvd.)	lb.	.11 -	.13
N-5 Pentane Mix. (t.c.)	**gal.**	**— -**	**.11½**
N-6 Hexanes (t.c.)	**gal.**	**— -**	**.14**
N-7 Hexanes (t.c.)	**gal.**	**— -**	**.13**
Petrolene (t.c.)	**gal.**	**— -**	**.10¼**
Picolines, Aplha, Refined	lb.	.75 -	1.00
Mixed	lb.	— -	.45
Proprietary Alcohol (t.c.)	**gal.**	**— -**	**.43½**
Pyridine, Refined	lb.	.80 -	.89
Quinoline	lb.	.50 -	.60
Rubber Solvent (t.c.)	**gal.**	**— -**	**.15**
Rubsol (t.c.)	gal.	— -	.08625
Skellysolve B (Hexanes) (t.c.)	gal.	— -	.141
C (Heptanes) (t.c.)	gal.	— -	.133
E (Octanes) (t.c.)	gal.	— -	.155
R (Solvent Naphtha)	gal.	— -	.109
Solvenol (dma.)	**gal.**	**— -**	**.36**
Solvent, Crude, Light	gal.	.19 -	.28
Solvesso 100 (t.c.)	**gal.**	**— -**	**.27**
150 (t.c.)	**gal.**	**— -**	**.27**
Sunny South Dipentene	gal.	.35 -	.36
Sunny South Pine Oil	gal.	.60 -	.61
Toluene (drums)	gal.	— -	.28
Toluol (t.c.)	**gal.**	**— -**	**.30**
Trichlorethane	lb.	.11 -	.12
Trigiycol Dichloride (dms.)	lb.	.519 -	.59
Tromex	lb.	.078 -	.083
Union Thinner 1	**gal.**	**— -**	**.149**
3	**gal.**	**— -**	**.149**
7	**gal.**	**— -**	**.139**
2-50-W Hi-Flash	gal.	— -	.35
X-7 Sp. Heptanes (t.c.)	gal.	— -	.11
Xylene (drums)	**gal.**	**— -**	**.30**

STABILIZING AGENTS (for Vinyl Resins)

Basic Silicate White Lead	lb.	.15½ -	.17¼
BVS	lb.	— -	.60
Cadmium Stearate	lb.	— -	1.25
Dutch Boy DS-207	lb.	— -	.50¾
Plumb-O-Sil A	lb.	— -	.28
B	lb.	— -	.29½
Tribase	lb.	— -	.24¼
Dythal	lb.	— -	.37½
Lead Stearate, Precip.	lb.	.36 -	.38
Fused	lb.	— -	.35½
Lithium Stearate	lb.	.63 -	.65
Stabelan E	lb.	1.25 -	1.40
XL	**lb.**	**.55 -**	**.65**
Stabilizer V-7939	**lb.**	**— -**	**.60**
Stabilizer JCX	**lb.**	**.49 -**	**.51**
SN	lb.	— -	.42
V-1-N	lb.	.44 -	.50
V-9	lb.	— -	.85
Vanstay	**lb.**	**.33 -**	**.35**

SUN CHECKING AGENTS

Antisol	lb.	.25 -	.26
Antisun	lb.	— -	.23
Heliozone	**lb.**	**.25 -**	**.26**
Sunolite	lb.	.20 -	.23
Sunproof	lb.	.25 -	.26
Imp.	lb.	.23 -	.24
Jr.	lb.	.18 -	.19
Tonox	lb.	.50 -	.52

TACKIFIERS

Advaresin 100	**lb.**	**.13½ -**	**.14**
Agchem RC 30	**gal.**	**.65 -**	**1.34**
Amberol ST-137X	lb.	.30 -	.30½
Arco 493-49B	lb.	.15 -	.17
700-25A	lb.	.14 -	.16
U2-24	lb.	.11 -	.13
Beckopol 1400 (dlvd.)	**lb.**	**.25½ -**	**.26**
Dutrex 44	gal.	— -	.919
E-310 Resin Emulsion	lb.	— -	.14
Galex (drums)	**lb.**	**— -**	**.15**
Koresin	lb.	.73 -	.75
Liquid Rubber Flux	lb.	— -	.125
Pentalyn A (dlvd.)	lb.	.13 -	.13½
Resin V	**lb.**	**— -**	**.23¼**
Rubtack	lb.	— -	.12
Staybelite Ester No. 10 (dlvd.)	lb.	.19 -	.19½
Super-Beckacite No. 1001 (dlvd.)	**lb.**	**.34 -**	**.34½**
Synthol	lb.	— -	.20½
Vistac No. 1	gal.	— -	1.32
No. 2	gal.	— -	1.66
No. 4	gal.	— -	1.80

THICKENERS (FOR LATEX)

Acrysol GS	lb.	.13 -	.18½
Alcogum A-5	**lb.**	**.10 -**	**.12**
Betanol (drums)	lb.	— -	.70
Emulsorex No. 5	lb.	— -	.35
Lecithin	**lb.**	**.12 -**	**.17**
Polyco 296	lb.	.13 -	.15
Propylene Laurate (dma.)	lb.	— -	.36
Sodium Silicate	**cwt.**	**1.10 -**	**2.00**

VULCANIZING AGENTS

Selenium

Vandex	lb.	— -	2.00

Sulfur

Blackbird	**cwt.**	**— -**	**2.30**
Crystex	lb.	.19½ -	.23
Darex Dispersed Sulphur	lb.	.12 -	.17
Dispersed Sulfur	lb.	.12 -	.17
Devil (c.l.)	**cwt.**	**— -**	**1.75**
Insoluble Sulfur 60	lb.	.13 -	.13½
Spider	**cwt.**	**— -**	**2.30**
Star (c.l.)	**cwt.**	**— -**	**2.25**
Tire (c.l.)	cwt.	— -	1.75
Tube (c.l., dlvd.)	cwt.	— -	2.25

Tellurium

Latex Telloy	lb.	— -	2.00
Telloy	lb	— -	2.00

Miscellaneous Vulcanizing Agents

VA-3	lb.	.55 -	.65

WASHING & FINISHING AGENTS

Apcolene (t.c.)	gal.	— -	.09½

WETTING AGENTS

Advawet No. 10	lb.	— -	.35
No. 15	lb.	— -	.18
No. 33	lb.	.40 -	.43
Aerosol OT 70% Clear	lb.	.80 -	1.00
Agchem SA-15 (16, 18)	lb.	.17 -	.29
Alrosol (dma.)	gal.	— -	.48
Aquarex D	lb.	— -	.76
MDL Paste	lb.	— -	.30
ME	lb.	— -	.92
NS	lb.	— -	.60
WA Paste	lb.	— -	.25
Areskap 50	lb.	.30 -	.38
Dry 100	lb.	.60 -	.72
Aresket 240	lb.	.30 -	.38
Dry 300	lb.	.60 -	.72
Aresklene 375	lb.	.42 -	.57
Dry 400	lb.	.70 -	.84
Armacs	**lb.**	**.29 -**	**.76**
Arquads	**lb.**	**.24 -**	**.27**
Etho-chemicals	**lb.**	**.34 -**	**.80**
Lecithin	**lb.**	**.12 -**	**.17**
Parnol	lb.	.13 -	.18
Santomerse D	lb.	.43 -	.65
S	**lb.**	**.12 -**	**.25**
Sorbit P	lb.	— -	.28
Stablex G	lb.	— -	.70
Trenamine W-50	**lb.**	**.20 -**	**.22**
Triton K-60	lb.	.33½ -	.41
R-100	lb.	.13½ -	.24
X-100	lb.	.37 -	.44½
X-200	lb.	.30½ -	.38
770	lb.	.19½ -	.27
Vultamol	lb.	— -	.17½
Wetsit Conc.	lb.	.25 -	.32

MISCELLANEOUS CHEMICALS

Acto 450 (550-W, 600, 630)	lb.	.109 -	.145
Agchem SA-17	**lb.**	**— -**	**.29**
Aquarex SMO	lb.	— -	.50
A.S.T.M. Oil No. 1 (and No. 3)	**gal.**	**1.00 -**	**1.15**
Copper Inhibitor X-872-L	lb.	— -	1.95
2-Ethylhexanol (dma.)	lb.	.25 -	.26
Glycerine, 88% Sap., Crude (dlvd.)	**lb.**	**.20½ -**	**.21**
MODX	lb.	.295 -	.345
NBC	lb.	— -	1.50
Para Resin No. 2457 (c.l.)	lb.	— -	.04
No. 2718 (c.l.)	**lb.**	**— -**	**.04**
Pigmented Filmite	lb.	— -	.16½
Polyvinyl Methyl Ether	lb.	— -	1.00
Reference Fluid SR-6	gal.	.85 -	1.00
SR-10	gal.	.60 -	.75
Resin No. 1226	**lb.**	**.31½ -**	**.36½**
Rio Resin	lb.	.50 -	.52
Santocel	**lb.**	**— -**	**.50**
Sherosope L, N, F-445 and P	lb.	.12½ -	.15
Sublac	**lb.**	**.30 -**	**.32**
Syrupep N (drums)	**lb.**	**— -**	**.54**
Thiokol LP-2	**lb.**	**— -**	**.90**
LP-3	lb.	— -	.90
Tysonite	**lb.**	**.21½ -**	**.23¼**
Vanfre	**gal.**	**2.00 -**	**2.50**
Vinsol Resin—Lumps	cwt.	— -	3.25

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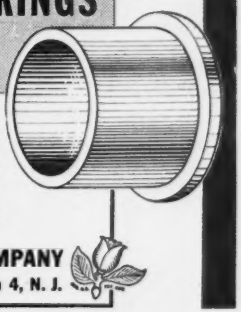

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INDEX TO ADVERTISERS

A

Adamson United Co. —
Akron Equipment Co. 585
Akron Rubber Machinery Co. —
Albert, L., & Son 599
Alco Oil & Chemical Corp. 591
American Cyanamid Co.
Calco Chemical Division 515, 521
Industrial Chemicals Division —
American Zinc Sales Co. —
Atlas Electric Devices Co. —

B

Bacon, Frederick S., Laboratories 600
Baird Rubber and Trading Co. 591
Baker, J. T., Chemical Co. —
Baldwin Locomotive Works —
Barrett Div., Allied Chemical & Dye Corp. 494
Beccon Co. 518
Bestread Products Co. 599
Binney & Smith Co. Insert Following 560
Black Rock Mfg. Co. 591
Bolling, Stewart, & Company, Inc. 581
Bonwitt, Eric 600
Bridgwater Machine Co., Athens Machine Div. —
Brockton Cutting Die & Machine Co. 587
Brooklyn Color Works, Inc. —
Brown Company 583

C

Cabot, Godfrey L., Inc. 509
Cambridge Instrument Co. 579
Cameron Machine Co. 582
Carey, Philip, Mfg. Co. 597
Carter Bell Mfg. Co. 585
Chemical & Pigment Div., Glidden Co. —
CLASSIFIED ADVERTISING 598, 599, 600
Cleveland Liner & Mfg. Co. 492
Colledge, E. W., General Sales Agent, Inc. —
Columbian Carbon Co. Inserting Following 560
Concord Mica Corp. 601
CONSULTANTS SECTION 600
Continental Carbon Co. 505
Cooke Color & Chemical Co. —
Coulter, James, Machinery Co. 578

D

Deecy Products Co. —
Derby-Oxide & Colour Co., Ltd. 600
Dewey and Almy Chemical Co. —
Diamond Alkali Company
Pure Calcium Prod. Div. 508
Dow Corning Corp. 517
Du Bois Co. 593
du Pont de Nemours, E. I., & Co., Inc.
Organic Chemicals Department 506
Rubber Chemicals Div. Second Cover & 497

E

Emery Industries, Inc. 513
Emerson Apparatus Co. 581
English Mica Co. 597
Erie Engine & Mfg. Co. —

F

Farrel-Birmingham Co., Inc. 575
Fawick Airflex Co., Inc. 507
Federal Products Corp. 587
Ferry Machine Co. 599
Flintkote Co., The —
Foxboro Company 574

G

Gammeter, W. F., Co. 600
General Atlas Carbon Co. 519
General Electric Co.
Apparatus Dept. 525
Chemical Dept. —
General Latex & Chemical Corp. 500
General Magnesite & Magnesia Co. —
Genseke Brothers —
Georgia Marble Co., Calcium Products Div. 573
Gidley, Philip Tucker 600
Glidden Co., Chemical & Pigment Div. —
Goodrich, B. F. Chemical Co. (Chemical) 487
Goodrich, B. F. Chemical Co. (Hycar) —
Goodyear Tire & Rubber Co. (Chemical Div.) 489, 493

H

Hall, C. P., Co. 524
Hardman, H. V., Co., Inc. —
Harwick Standard Chemical Co. Back Cover
Heveatex Corporation —
Hoggson & Pettis Mfg. Co. 581
Holliston Mills, Inc. —
Howe Machinery Co., Inc. 600
Huber, J. M., Corp. 528

I

Indoil Chemical Co. —
Industrial Ovens, Inc. 504
Institution of the Rubber Industry —
Interstate Welding Service 527

J

Johnson Steel & Wire Co., Inc. 597

K

Koppers Co., Inc., Chemical Div. —

L

Lambert, E. P., Co. 595
Latex Distributors, Inc. —
Littlejohn & Co., Inc. 595

M

Magnetic Pigment Div., Columbian Carbon Co. —
Magnolia Metal Co. 599
Marbon Corp. 516
Marine Magnesium Products Corp. 593
Maryland Cork Co. —
McNeil Machine & Engineering Co. —
McNulty, Joseph A. 600
Monsanto Chemical Co. —
Mt. Vernon-Woodberry Mills, Inc. 597
Muehlstein, H., & Co., Inc. 571
Mumper, James F., Co. 600
Murray, D. J., Mfg. Co. 576

N

National-Erie Corp. —
National Lead Co. 514
National Rosin Oil Products, Inc. 595
National Rubber Machinery Co. —
National Sherardizing & Machine Co. 597
National-Standard Co. —
Natural Rubber Bureau 523
Naugatuck Chemical, U. S. Rubber Co. 491, 530
Neville Co. —
New Jersey Zinc Co. 495

O

Olin, R. R. Laboratories 600

P

Pan American Chemicals
Div. Pan American Refining Corp. —
Pennsylvania Industrial Chemical Corp. 503
Phillips Chemical Co. 488
Pittsburgh Plate Glass Co., Columbia Chemical Div. 499

R

Rand Rubber Co. —
Randall, Frank E., Co. —
Rare Metal Products Co. 595
Richardson, Sid, Carbon Co. 602
Robertson, John, Co. 502
Rotex Rubber Company, Inc. 598
Royle, John, & Sons 587
Rubber Corp. of America, Latex Div. 593

S

St. Joseph Lead Co. —
Schulman, A., Inc. Inside Back Cover
Scott Testers, Inc. 572
Sharples Chemicals Inc. 490
Shaw, Francis, & Co., Ltd. —
Siempelkamp, G., & Co., Maschinenfabrik 579
Simplex Cloth Cutting Machine Co., Inc. 589
Sivon Machine Co. —
Skelly Oil Co., Solvents Div. 496
Skelton, Sleat & Co., Ltd. —
South Asia Corp. 595
Southeastern Clay Co. 593
Southern Clays, Inc. —
Spadone Machine Co. 579
Stamford Rubber Supply Co. 589
Stanley Chemical Co. 584
Stanley Electric Tool Div. 580
Stauffer Chemical Co. 501
Stein, Hall & Co., Inc. —
Stoner's Ink Co. 601
Sun Oil Co. —

T

Tamms Industries, Inc. —
Tanney-Costello, Inc. —
Taylor Instrument Companies 577
Textile Proofers Inc. —
Thropp, Wm. R., & Sons 589
Titanium Pigment Corp. 498
Turner Halsey Co. 597

U

United Carbon Co. Insert Following 510
United Engineering & Foundry Co. —
United Rubber Machinery Exchange —
U. S. Rubber Reclaiming Co. 526
Utility Mfg. Co. 585

V

Vanderbilt, R. T., Co. Front Cover

W

White, J. J., Products Co. —
Williams, C. K., & Co. —
Wills Rubber Trimming Machine Co. —
Wilson, Charles T., Co., Inc. 595
Witco Chemical Co. 505
Wood, R. D., Co. —
Wyandotte Chemicals Corp., Michigan Alkali Div. 510

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